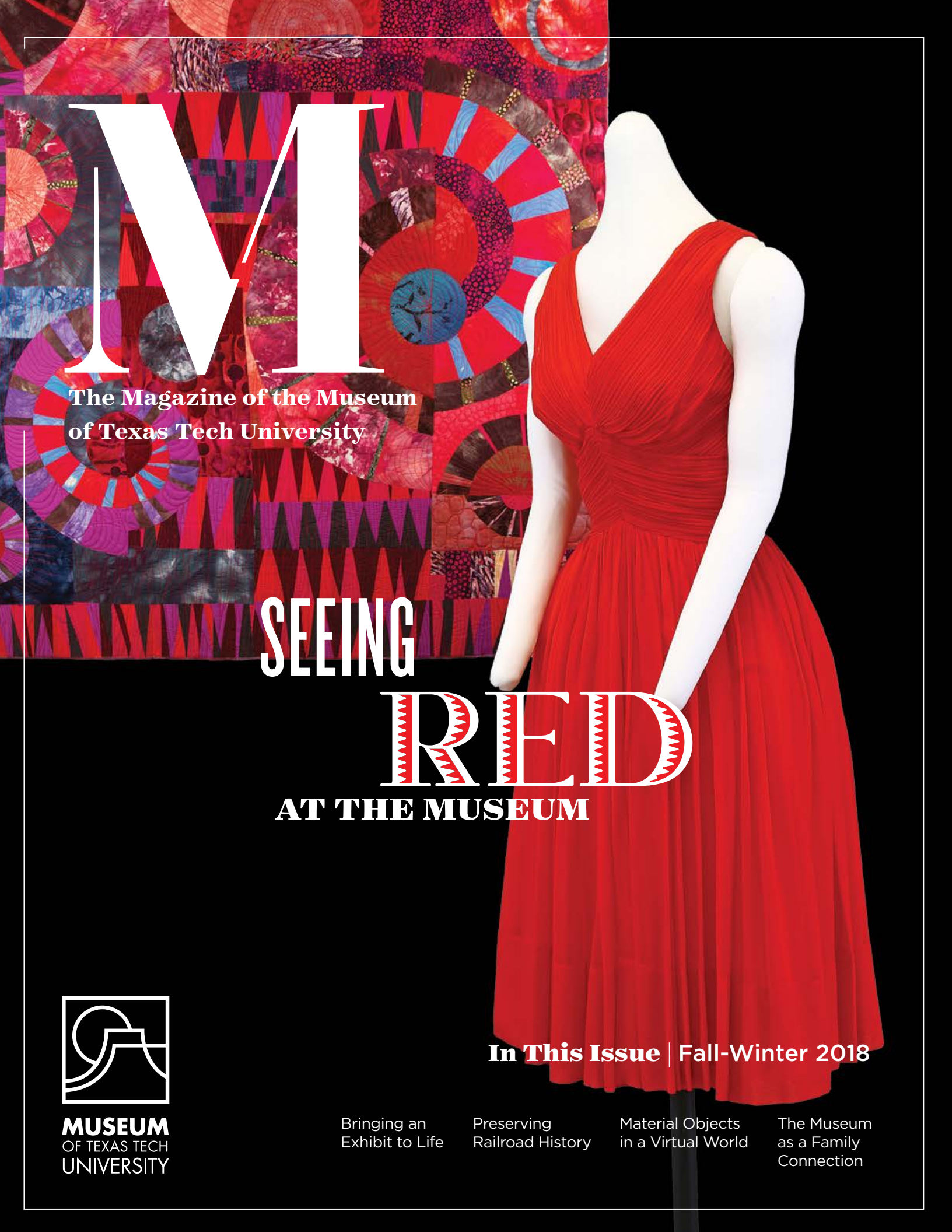


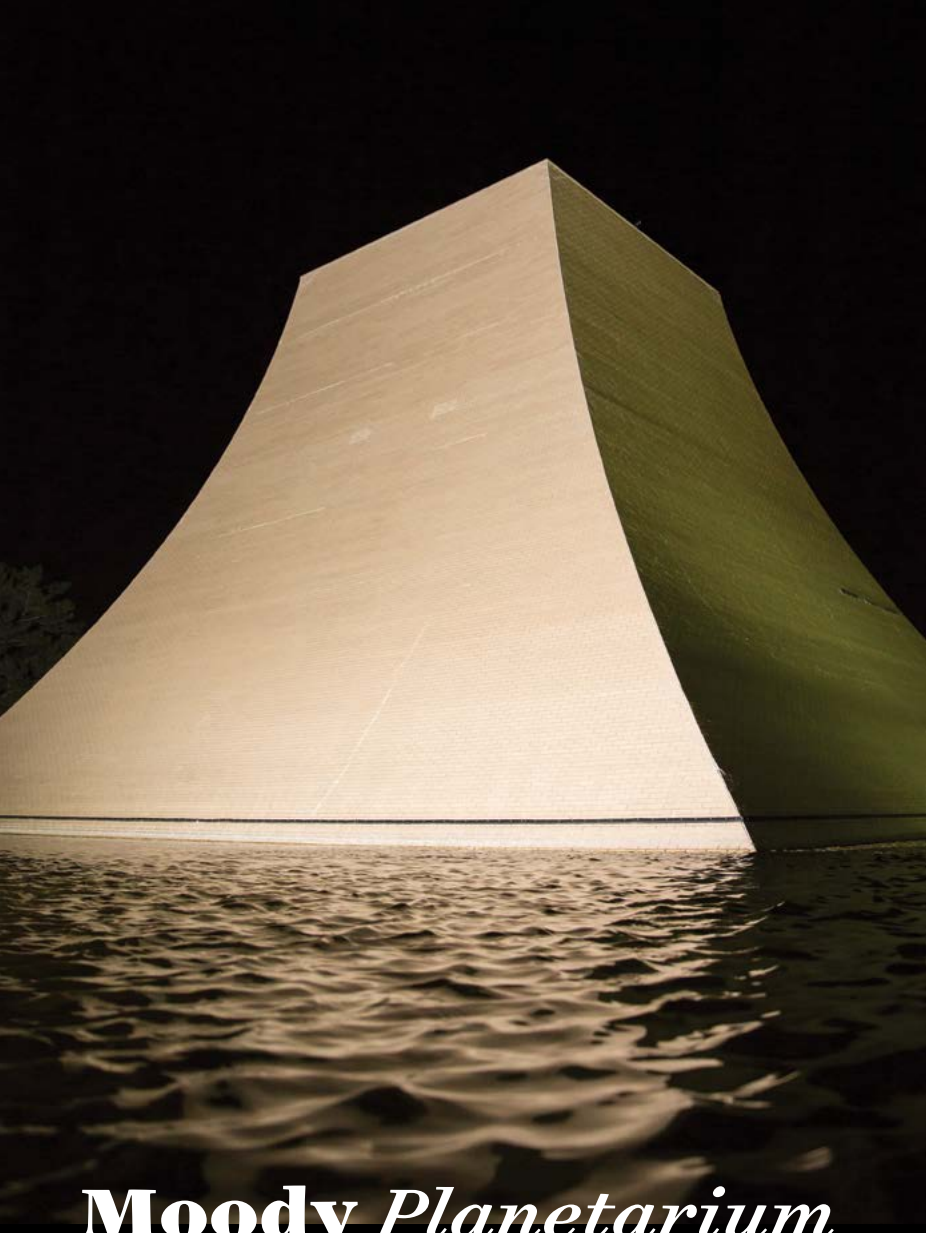
M

The Magazine of the Museum of Texas Tech University

SEEING RED AT THE MUSEUM

MUSEUM OF TEXAS TECH UNIVERSITY

In This Issue | Fall-Winter 2018



Moody *Planetarium*

Tuesday	Saturday	Sunday
1:30 p.m.	*11:30 a.m.*	*1:30 p.m.*
2:00 p.m.	*12:30 p.m.*	*2:30 p.m.*
3:30 p.m.	*1:30 p.m.*	*3:30 p.m.*
	2:30 p.m.	
Friday	*3:30 p.m.*	
1:00 p.m.		
2:00 p.m.		
3:30 p.m.		

Cover Images:

Detail of Muscle Bellies Best quilt by Marika Pineda. Image courtesy of artist. Red Chiffon Short Formal, 1970s, gift of Mrs. Tom Pogue. Photography courtesy of Bill Mueller.

M
The Magazine of the Museum of Texas Tech University
Fall/Winter 2018

Staff
Publisher and Executive Editor
Gary Morgan, Ph.D.
Editor
Sally Logue Post
Editorial Committee
Daniel Tyler, Jill Hoffman, Ph.D., Lisa Bradley
Design
Armando Godinez Jr.

This issue of M the Magazine of the Museum of Texas Tech University is made possible by the generous support of the CH Foundation.

M is a biannual publication of the Museum of Texas Tech University.
3301 4th St, Lubbock, TX 79409
Phone: 806.742.2490
www.museum.ttu.edu

American Alliance of Museums Accredited Museum

MUSEUM OF TEXAS TECH UNIVERSITY

TEXAS TECH UNIVERSITY

90TH ANNIVERSARY
1929-2019
Diversity & Connections

Prepare *to* Party

The Museum of Texas Tech University celebrates its 90th anniversary in 2019.

The idea for a museum took form only four years after Texas Technological College opened. On March 27, 1929, a group of citizens interested in forming a museum met, as reported in the Daily Toreador, to "form a society to help make collections and further the movement (of the Museum) in general."

From that meeting grew the Plains Museum Society, which evolved into the Museum of Texas Tech University Association.

The first museum, the West Texas Museum, opened in 1937 in what is now Holden Hall on the Texas Tech campus.

By the mid-1960s, the Museum Association began planning for a new Museum building, located in its current location at 4th Street and Indiana Avenue. The building opened in 1970.

In 2019, the Museum will celebrate its history, show off the best of its collections, and throw a few parties to celebrate.

Watch for more information about exhibitions and events on our website at museum.ttu.edu and in the spring/summer 2019 issue of M.

*Information drawn from the book "West Texas Museum Association 1929-1979."

Inside M

Medici's Treasures

It never seems quiet at the Museum, but this fall it feels especially busy. We have two public programs that we hope will attract a very broad audience, with, as the saying goes, a little something for everyone.

The first of these programs should appeal to all good Red Raiders, as it is inspired by the color red. Red is the color of passion, power -- and great sporting teams. Our Red program spans biology, history, culture, art, and fashion. It centers on the traveling exhibition, *The Red that Colored the World*, developed by the Museum of International Folk Art in Santa Fe, New Mexico. The exhibition explores the place of the insect-based dye cochineal in history and design through the centuries. Who would have thought that a lowly bug could have caused such a stir around the world?

Complementing this exhibition is *Ladies in Red*, an exhibit from the Museum's collection of clothing that profiles some of the most colorful – red colored of course – garments in our holdings, ranging from cheerleader costumes to designer gowns. The Museum's clothing and textiles collection is the finest of its kind in Texas.

The final component is *Red, Hot & Quilted* which exhibits an eclectic array of quilts from the Caprock Art Quilters. The quilts have all been inspired by themes in *The Red that Colored the World*.

The second program this fall relates to two exhibitions about two of the most influential books of all time.

Coinciding with the 500th anniversary of the publishing of the Complutensian Polyglot Bible, the Museum presents *Pre-Modern Bibles: From the Dead Sea Scrolls to the Complutensian Polyglot Bible*. The Polyglot Bible was the first comprehensive, printed edition of the entire Old and New Testaments, with side-by-side versions of the same text in multiple languages. The exhibition will explore the colorful evolution of the Bible through the Middle Ages and Renaissance. Coincidentally, Complutense University in Spain, founded in 1293, was the inspiration for the Spanish Renaissance architectural style of the Texas Tech University campus.

Concurrently, the Museum will present the exhibition *Sandow Birk: American Qur'an*. Over 10 years, Southern Californian painter Sandow Birk hand-transcribed and illustrated every chapter of the Qur'an using the calligraphy of the individual verses to frame scenes of contemporary American life. The

Museum is displaying a selection of his works together with additional background information about the holy book of Islam.

The two exhibits are very different. One is historical, the other, an exhibit of art. Hosting them together allows the Museum to engage audiences simultaneously with these two extraordinarily powerful and influential books. The two great books have much in common, and there are strong overlaps in the narratives of their chapters. The Museum intends that the exhibits will be a platform for public talks and workshops about the Bible and Qur'an, their history, their art, and their place in contemporary global society. It is a vital role of museums, especially university museums, to be a forum for discussion about our society, our values, and our beliefs as a diverse and inclusive community.

So this fall, come by the Museum to be both red and well-read in culture, art, and history.

And as a prelude to next year.... In 2019 the Museum of Texas Tech University turns 90. Stay tuned as we announce our plans for a great birthday bash program.

Gary Morgan, Ph.D.

Executive Director

Collections Highlights

How Do You Move Really Big Stuff?

By: Cameron Saffell, Ph.D., Curator of History

In the case of the Museum of Texas Tech University's Pink Cadillac, it takes about 10 students and one curator.

The 1957 Coupe de Ville made the roughly 200 foot trip down Gallery 6 and back into storage in late August. The car was moved to make way for the *Pre-Modern Bibles: From the Dead Sea Scrolls to the Complutensian Polyglot Bible* exhibition that opened Aug. 18 in Gallery 6.

The first step to moving the Museum's '57 Caddy back into storage involved jacking the 4,800-pound automobile up to slide dollies under each wheel so it could roll down the hallway. The Cadillac is arguably the heaviest object in the Museum's collections.

It's typical for museums to move objects in and out of storage. The Cadillac has been on display for a little more than a year, marking the first time it's been out of storage since 1984. The car is arguably the largest single item in the Museum's 8 million object collection. It weighs in at 4,800 pounds and requires a lot of man and woman power to move.

The car, which takes up 626 cubic feet of storage space, had been set against a wall at the front of the gallery. To move the car, it was first jacked up, then dollies were positioned under each wheel, and it was slid away from the wall. Flat tires caused a bit of delay, but once they were aired up, the car was pushed the length of the gallery and back into storage.

After about an hour of work, and a good bit of laughter, the job was done. The Caddy now sits among its friends in the Museum's collection of vintage vehicles.

The Cadillac had a list price of $5,048, about $44,700 in today's dollars. It came equipped with a 364 cubic inch V-8 engine, a remote-controlled outside mirror, a vanity mirror on the passenger side, four cigarette lighters, electric bench seat, and an electric clock. Optional equipment included an air conditioner, heater, radio, and fog lights.

The car is called a Pink Cadillac, but the color is officially known as Mountain Laurel, which was introduced in 1956 along with Princess Green and Duchess Green. The new colors were Cadillac's attempt to entice more women to buy Cadillacs.

Elvis Presley had a custom pink 1955 Cadillac Fleetwood and mentioned the car in his song, "Baby, Let's Play House," also in 1955. Elvis' growing popularity and connection to the Pink Cadillac helped make Mountain Laurel the company's most popular and iconic color of the 1950s. The color later inspired the Mary Kay Cadillacs, given to the top saleswomen of the cosmetics line.

The Pink Caddy was first loaned to the Museum in 1984 for the exhibit, *Nothin' Else to Do: 75 Years of West Texas Music*. It was subsequently donated to the Museum courtesy of Anita Condit.

A video of the great Cadillac move is available on the Museum's website at museum.ttu.edu.

What is a Knotting Shuttle?

By: Marian Ann J. Montgomery, Ph.D., Curator, Clothing and Textiles

The museum recently received a significant donation of 152 knotting and tatting shuttles that had been collected by Helen Grappe Graf of Levelland. There are 69 knotting shuttles and 83 tatting shuttles in the collection. The Museum is happy to accept these items for the Clothing and Textiles Division because they were used by tastemakers of their era and are beautiful objects that will serve to enhance the interpretation of needlework already in the Museum's collection.

Knotting shuttles can be confused with tatting shuttles, especially because they haven't been in common use since the 18th century. Gay Ann Rogers, the author of "An Illustrated History of Needlework Tools," is one of the best sources of information on these beautiful objects. She writes that the knotting shuttle uses a larger thread than a tatting shuttle to produce a cord for applique in surface embroidery, while the tatting shuttle creates its own fabric. Tatting shuttles have pointed ends that nearly touch because of their convex top and bottom. The knotting shuttle has a nearly flat top and bottom, and considerable space between its rounder ends. Knotting shuttles are larger than tatting shuttles.

The knotting shuttle was often made of costly materials and was a prized possession of 18th-century women. It was used at social gatherings as much for display as for anything else. When using a knotting shuttle, a woman's hands were put in a graceful position, which was thought ideal in the 18th century. Because of its social importance, knotting shuttles tend to be elegantly proportioned and made of costly materials. Some are decorated both on the top and the bottom.

The shuttles that came to the Museum from Mrs. Graf are made of silver, steel, paper mache, porcelain, and other precious materials and are sometimes gold coated. They are all beautiful either in their simple elegance or with their elaborate decoration. One can imagine an 18th-century woman seated in elegant silks or the latest printed cotton from India creating knots with these elegant accessories.

Dieppe carved ivory filigree knotting shuttle with cherub and floral motifs. French. 18th century. Gift of Dave and Patrick Graf, TTU-H2018-033-001

Paper mache knotting shuttle with decorations of birds, fruit, wheat, cartouche, and spoked circle. Imprinted on the post: "Clay Patent," 18th century. Gift of Dave and Patrick Graf, TTU-H2018-033-010

Wooden knotting shuttle painted with scene of birds, having lacquered finish. French, circa 1780. Gift of Dave and Patrick Graf, TTU-H2018-033-005

Silver etched mother of pearl knotting shuttle, possibly English, 18th century. Gift of Dave and Patrick Graf, TTU-H2018-033-007

Silver filigree knotting shuttle with floral motifs, circa 1800. Gift of Dave and Patrick Graf, TTU-H2018-033-145

Gilt silver knotting shuttle with image of seated woman and standing man, French, circa 1760. Gift of Dave and Patrick Graf, TTU-H2018-033-006

Artist Printmaker/Photographer Research Collection Draws International Attention

The Artist Printmaker/Photographer Research Collection (AP/RC) housed in the Museum of Texas Tech University is drawing international attention from a journal dedicated to fine art prints.

An article by Peter Briggs, the Helen DeVitt Jones curator of art at the museum, is featured in the July–August 2017 issue of "Art in Print, The Global Journal of Prints and Ideas." His article, "Miles from Nowhere: Collecting Contemporary American Prints in the Margins," focuses on the museum's success in building a major art collection in a facility located outside a major metropolitan area.

"Attention from the most important journal on art and prints published in the United States indicates the influence our collection is having," Briggs observed. "The research and art collection we have developed—and continue to develop—is having regional, national and international impact. Right now, for example, almost 25 percent of our virtual contacts are from outside the United States. This article is of major assistance in our efforts to advance research and programming on creativity at the Museum and at TTU in general."

The AP/RC is made up of the world's largest collection of 20th and 21st century American print artists from the western United States. More than 12,000 prints and photographs from hundreds of artists make up the AP/RC, but it contains much more than the finished artworks. The collection also includes the artists' writings, drawings and other archival materials, elements that Briggs says give the collection unparalleled depth into creative processes.

M | NEWS

Scholars across the Pond

During a visit to the Netherlands, Marian Ann Montgomery, Ph.D., the Museum's clothing and textile curator, spoke on feed sacks from the Museum's collection at the Textile Research Centre in Leiden.

The Centre's collections feature clothing of peoples across the world. Sometimes thought of as folk dress, the collection is a colorful assemblage of materials from every world culture and a treasure trove for research. More information is found on their website www.trc-leiden.nl

The Centre had been given a few American printed cotton feed sacks, and from a grant through the American Embassy in the Netherlands the Centre was able to mount a small exhibit of feed sack materials. The exhibit included swatches, full feed sacks, advertisements from American magazines, clothing, and quilts made from feed sacks.

Montgomery was invited to speak on the flour sacks embroidered in Belgium during World War I. The Commission for Relief in Belgium (CRB) provided flour to Belgians during the German occupation. The cotton sacks used to package the flour were carefully controlled so that they didn't fall into German hands where they might be made into ammunition. The sacks were sent to Belgian workrooms where they were made into garments and sometimes embroidered as thank yous to Americans. One such rare example is in the Museum's collection and is part of the research Montgomery has been doing in preparation for the planned Texas Tech University Press book on feed sacks and a 2019 exhibit.

The Dutch were pleased to have Montgomery's expertise and the eye she has developed from looking at 3,000-plus examples of printed feed sacks. An offer of late 19th-century needlework pieces had come in before the trip, and Montgomery was able to get input on the objects from Gilliam Vogelsang-Eastwood, Ph.D., the director of the Textile Research Center, who has an expertise in late 19th-century needlework.

An ongoing conversation continues between Montgomery and Annelien Van Kempen who was working at the Centre at the time and is a researcher of decorated WWI Belgian flour sacks. Van Kempen is trying to build a database of all the existing embroidered flour sacks from the CRB that survive in collections across the world. These interactions underscore the importance of the Museum's professional staff interacting with scholars all over the world.

From the feed sack exhibit at Textile Research Centre, Leiden, the Netherlands, April 2018, showing examples of printed fabrics used to make feed sacks as well as quilts that had been made from printed feed sack fabrics.

Marian Ann Montgomery speaks on embroidered flour sacks from the Belgium Relief Effort to an audience at the Textile Research Centre, Leiden, the Netherlands.

Embroidered flour sack from the relief efforts to Belgium during World War I that is in the Museum's collection. Partial gift of Pat L. Nickols and funds from The Quilter's Guild of Dallas, Inc., The South Plains Quilter's Guild, and individuals, TTU-H2015-053-005-001.

Museum Receives Grant to Aid School Districts in Funding Field Trips

As funding tightens for public schools, administrators have been forced to cut back on programs such as field trips. The Museum of Texas Tech University Association has received a grant from the E.A. Franklin Charitable Trust to help rural and economically underserved schools on the South Plains take field trips to the Museum and the National Ranching Heritage Center.

The $25,000 grant will be used as needed over multiple years to assist school districts considered as Title One schools, in paying for fuel and bus rental costs for the trips. Schools using this fund for transportation to the Museum will be encouraged to extend their field trip to include the National Ranching Heritage Center, located next door to the Museum.

"A field trip to the Museum offers students of all ages one-on-one experiences with real things," said Jouana Stravlo, executive administrator of the Association. "It's one thing to see pictures in a book or on a screen, but seeing a real painting or fossil or other object allows an individual to engage on many levels."

Thousands of public and private schools students visit the Museum each year on field trips. Jill Hoffman, the Museum's assistant director for visitor experience and the Helen DeVitt Jones Curator of Education, believes that learning outside of the classroom is important for children, allowing them to imagine who might have held or used that object, or what life may have been like in the era the object was created.

"Teachers can use the Museum's objects to spark discussions and help students gain knowledge and understanding," Hoffman said. "Museum field trips also provide students of all ages with an informal means of learning that is particularly helpful for students who do not do well in traditional, formal classroom settings."

Title One is the state of Texas designation for low-income schools, and it is based on the percentage of students who receive free or reduced-price lunch. The field trip grants will be awarded on a first come, first served basis.

Grant Awarded to Art with Emotion Program

The Museum's Education Division recently received funding to continue the Art with Emotion program via a grant by the South Plains Foundation. Started in the spring of 2016 by then Education intern Bethany Cheshire, Art with Emotion works with individuals who have autism, using the art in the Museum to help strengthen its students' interpersonal skills.

Cheshire, who will begin the special education doctoral program at Texas Tech in spring 2019, will continue to partner with the Burkhart Center for Autism Education and Research at Texas Tech thanks to the grant funding.

Bethany Cheshire, left, and some of the students in the Art with Emotion program. The program is a partnership between the Museum and the Burkhart Center for Autism Education and Research at Texas Tech.

Individuals on the autism spectrum have a difficult time recognizing facial expressions and body language in other people, making it difficult for them to communicate. Art with Emotion uses works of art in the Museum to help those with autism to recognize emotion in others. Each session focuses on a different emotion, and students view works of art that reflect that emotion. Participants discuss what they think the facial expressions and body language for each emotion would look like; then they discuss how subjects in each work of art portray these emotions.

At the end of each session, participants are given the opportunity to create their own art based on the emotions discussed. For example, the group might create mosaics that helped them identify what makes them sad, then discuss methods to overcome their sadness. In addition to focusing on recognizing emotions, facial expressions, and body language, the participants also discuss their experiences with certain emotions. The program helps participants integrate better into social situations - and with this funding, even more can be accomplished.

In addition to the art supplies and duplicate prints of the Museum's art, the funding will provide a sensory box containing items helpful to individuals with autism. Whether its earmuffs, sunglasses, or fidget cubes, small accommodations made specifically for those with sensory conditions can improve a person's visit to the Museum. The sensory boxes also can be checked out by guests during museum visits.

The museum now has special backpacks with tools to help those with autism or other special sensory needs enjoy a visit to the Museum. Included in the backpacks are noise reducing headphones, weighted suspenders, sunglasses, and fidget toys. The backpacks are available from the Museum's Education Division.

West Texas Eco-Garden

The Museum has moved the Tug o' War sculpture by Glenna Goodacre to make way for construction on the West Texas Eco-Garden.

Tug o' War, a cast bronze sculpture done in 1988, has been moved into the collections area until a new base is constructed and the popular sculpture can be placed in a new home inside the Museum. Tug o' War should be back on view in a few months.

Over time, the Eco-Garden will interpret the major natural habitats of West Texas, telling stories of the evolution of the High Plains and how humans have adapted to living in the region's wide open spaces.

The garden will feature a diverse landscape using plants that are found in the region around Lubbock such as short-grass prairie plants. Shortgrass prairie is one of the major types of grassland in North America and comprises a mix of grasses and other annual and perennial flowering plants.

A dominate feature of the Eco-Garden plan is an area that is representative of an arroyo that will form an entryway to the main northern doors of the museum. Arroyos are washes that divert water after rains but are dry for much of the year.

The project's goal is to achieve a sustainable landscape that requires minimal or no additional watering. Materials such as the concrete and bricks torn up by the construction will be reused in forming the arroyo.

Eventually, there will be lighting, seating, and shade trees, creating an area that will be both educational and lovely to visit.

When construction is finished, the West Texas Eco-Garden will interpret the major natural habitats of West Texas.

The Tug o' War bronze sculpture by Glenna Goodacre has been moved to make way for the West Texas Eco-Garden construction.

The West Texas eco-garden is made possible by the generous support of the CH Foundation, and funding through the landscape enhancement program of the Texas Tech University System. The system allocates 1 percent of the estimated total cost of each new construction project or each repair and rehabilitation project that exceeds $500,000 for landscape enhancement and an additional 1 percent for the acquisition of public art. The funding comes from the recent life safety project at the Museum.

OUR STUDENTS

The Museum as a Family Connection

By Du Chen

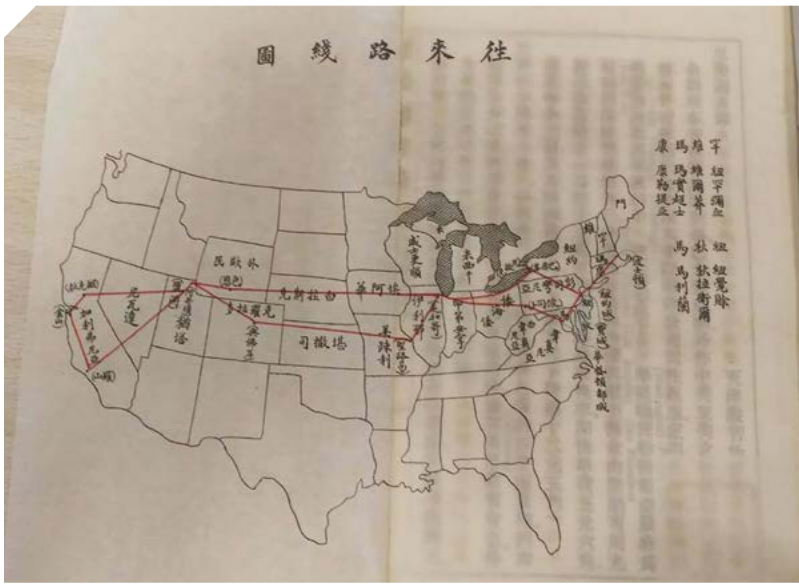
Heritage and Museum Science Graduate Student

In 1915, a team of young Chinese men arrived at the China House at the Panama–Pacific International Exposition, in San Francisco. The men were all present at the Exposition to help create the exhibits that represented China at that time. Some of them started to work on the display of plant and animal specimens. Others tried to figure out a suitable layout for showing Chinese painting. This was the first exhibition about China in a world's fair, and the group members were trying to do their best. In the busy, organized work environment, the leader of the team was reading a map of the United States. He was planning a trip across America to visit museums, after the world's fair ended. He had decided to build the first modern museum in China, and he wanted to experience and to learn as much as possible from American museums. His name was Zhiyi Yan, my great-grandfather.

The Chinese team in the Panama-Pacific Expostion. Zhiyi Yan, Du Chen's great-grandfather, is second from the right in the front row. Photo courtesy of Du Chen.

Fast forward to Tokyo, Japan, in the year 2010. I received a call from my mother. She asked me to check the yearbook of 1903 for my university because there should be the name of my great-grandfather. I was very surprised since this was the first time I had ever learned about my great-grandfather attending the same university! I did not even know his name before. The bigger surprise appeared after I checked the yearbook. He and I shared the same major, chemical engineering in Tokyo Institute of Technology.

I called my mother back and told her that I had found my great-grandfather's name in the student yearbook. Also, I told her how surprised I was to learn that he and I shared the same major. When I asked her why she had not told me anything about my great-grandfather, she said it is a sad story. When China became a socialist country after WWII, most people considered to be from wealthy and intelligent families were judged as "enemies of people." My great-grandfather's second daughter, my grandmother, was the first Chinese mezzo-soprano who could perform Italian opera. She was forced to leave Beijing to move to a faraway, extremely cold, small town. She had to give



The map traces Zhiyi Yan's 1915-1916 jouney across the U.S. visiting museums. Photo courtesy of Du Chen

up her singing career and later died due to heavy stress when she was only 48 years old. The misery caused by this experience resulted in my mother thinking that our family history was taboo.

I felt such a strong connection to my great-grandfather and started to research his life. I found the diary that he kept while he visited museums across the United States, in the early 1900s, visiting museums in Chicago, Boston, Pittsburgh, and New York City. My great-grandfather even met the then-president of Carnegie Museum of Art. He spent time at each museum learning collection management.

Du Chen

Moreover, he also developed a great passion for collecting art items from Native American communities and brought them back to China. He used these items as the first permeant exhibition in his museum, the Tianjin Museum. Those precious objects were almost all lost or destroyed during WWII. But his dairy is safe and still has tremendous value as a "how to" book for setting up a new museum and is also a fascinating record of the state of the field of American museums in the early 1900s.

"The fact is I am copying the life experience of my great-grandfather leads me to believe that he is guiding me on the best path even now."

As I learned more about my great-grandfather and his connection with museums, I never imaged that I, too, would start my museum career within four years. I had dreamed of becoming a fabulous scientist like Marie Curie. However, I realized that I prefer communicating science as opposed to doing science after an internship at the London Science Museum, in the United Kingdom. Later, I worked as an educator at the National Museum of Emerging Science and Innovation in Tokyo, before coming to the United States for the development of my career, enrolling as a student in the Museum of Texas Tech University Heritage and Museum Science program. The fact that I am copying the life experience of my great-grandfather leads me to believe that he is guiding me on the best path even now. Thanks to museums, I am connected to my family, even though I never got to meet some of them.

In 1918, China's first modern museum, Tianjin Museum, opened to the public. Around 60 percent of the collection was comprised of items donated from my great-grandfather. Until his death in 1935, he worked as the president of the museum and overcame many difficult situations, including budget shortages, the unstable social situation, and WWII.

This year is the 100th anniversary of Tianjin Museum, which my mother attended and saw the memorial exhibit. Although the collections of the museum are different from what my great-grandfather donated so many years ago, I am very proud that he left an extremely significant and priceless cultural heritage of China. He and I will walk together, forever.

Material Objects in a Virtual World

By Danielle Marshall

Heritage and Museum Sciences Graduate Student

Within the museum field, we normally do not classify our institutions as part of the service industry, however, maybe we should. The Museum of Texas Tech University is committed to serving the public, and in this process, we must consider the evolving trends of how most of society prefers to experience the world around them, which is through technology. Taking this commitment into account, the museum field must devise methods to incorporate new technologies through the enhancement of the educational experiences of interaction with the collection – and the Museum of Texas Tech University has a plan.

In summer 2017, I had the opportunity to sit in on a demonstration of a mixed-reality technology device called zSpace. The demonstration was hosted by Rebecca Hite, an assistant professor in the Texas Tech College of Education.

After a few minutes of experiencing the technology, I was instantly captivated. Shortly after meeting Dr. Hite, I quickly approached her with the notion of a research collaboration that involved her extensive knowledge of the technology and my connection to the Museum. The following semester, I enrolled in Dr. Stance Hurst's digital heritage course, to learn as much as I possibly could about the utilization of digital technologies as a tool for promoting cultural heritage within informal learning environments.

During the course, we had hands-on training with many forms of digital heritage techniques and topics, and we were instructed to choose a theme of the course to create a final digital heritage project. Inspired by the zSpace system, I chose to create a 3D model of an ancient camel skull from our collection at the Lubbock Lake Landmark. At the end of the semester, I had successfully made my first 3D model, loaded it onto zSpace, and had the opportunity to demonstrate the model on zSpace to my classmates. Seeing their reactions and how they utilized the system to interact with the model assured me that this technology needed to be somehow incorporated into the Museum.

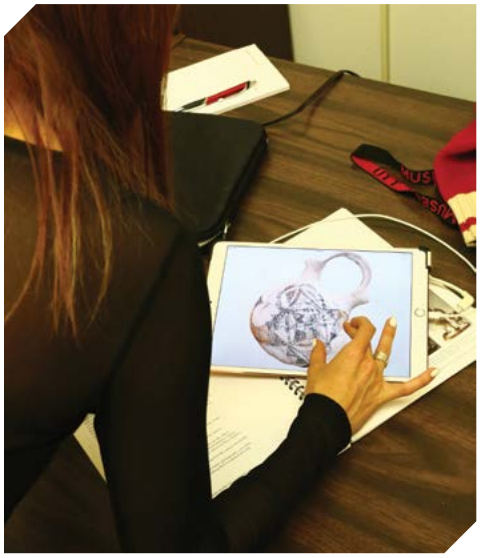
One of the most culturally significant collections that the Museum holds in trust is the Davies Collection. This collection includes a wide range of stunning Southwest Indian art, that consists of pottery, katsina dolls, baskets, textiles, and ceremonial/ritual objects, all donated by William and Evelyn Davies. As the word traveled around the Museum about the zSpace system, it was suggested by Gary Morgan, the Museum's executive director, that we make a special effort to incorporate this technology within the William C. and Evelyn M. Davies Gallery of Southwest Indian Art Gallery, "Beyond Expressions in Clay." The goal of this project is to give the public a better understanding of collection objects through the use of interactive, 3D activities. When I was offered an internship to head up the project, I quickly signed on.

The technology works by incorporating elements of both augmented and virtual reality, using a modified desktop computer, to provide an interactive experience that promotes user-driven active learning. The system uses 3D glasses that have a series of embedded sensors that provide a perception of depth, making the object on the screen appear to come to life and float out of the screen. The zSpace system is extremely user-friendly, which allows users of all ages to have an interactive and memorable experience, without being intimidated by the technology. Using a stylus pen, the user can interact with an object and manipulate it to get a 360-degree view. An additional zoom in/out capability allows for examination of the objects as they hover in front of a user. For example, a visitor can pick up a pot or storyteller doll and turn it any direction, look inside it, or study a close-up view of the design, things that cannot happen with the real object.

Aside from the obvious entertainment value, the ability to enhance the educational experience is immense. The models are created using a software application called itSeez3D, which uses aniPad to make a continuous, wide-area scan of the object by traversing the object as the software renders a model. The scans create an extremely detailed model that can be edited if needed and then uploaded into the zSpace system. This transforms the collection from a traditional exhibit of stationary objects under glass to moveable objects that allow visitors to get an up-close and personal perspective. From this new perspective, visitors will be able to explore the collection through a new type of sensory experience.

The process begins by scanning an Acoma pottery piece using an iPad & attached 3D Structure Sensor scanner.

The incorporation of zSpace with the Davies collection has two significant elements. The first is that the system allows us to create

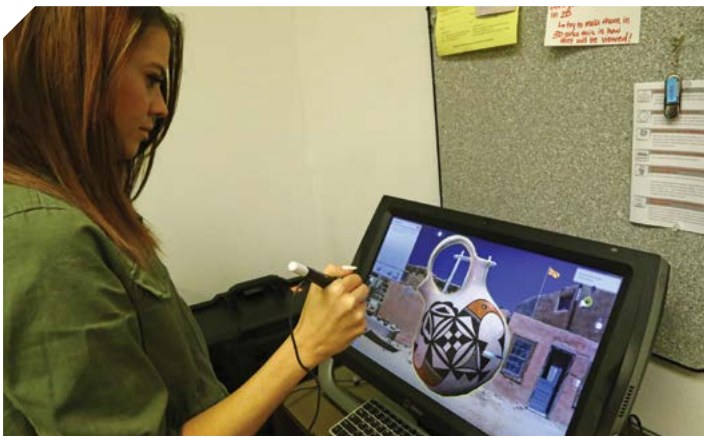


The image is next put through a 3D modeling application called itSeez3D, creating the base surface of Acoma pottery piece model and the textured wireframe surface is examined to make sure it's works correctly.

new forms of digital documentation of the collection, which can later be used remotely for scholarly research.

The second, and in my opinion the most important, focuses on the visitor experience. As a museum, it is our responsibility to provide innovative resources that can inspire visitors to establish a more personal connection to objects and to understand these objects as physical representations of a culture's heritage. Within museums, we use our collections to tell stories about the cultures that the artifacts represent, and to aid in telling these stories we must both invoke a will to learn and create an emotional experience. We must keep in mind that rather than designing our exhibits to be either educational or entertaining, we should ensure every effort is made to create a mindful blending of the two. More often than not, our interpretive materials are only as effective as the emotional connection a visitor has while interacting with them; and for many people, there is little to no interaction when reading text panels alone.

The zSpace systems aids in this interpretive service by combining 3D models that incorporate visual realism of the object's appearance and perception of depth, to create a dynamic, informal learning environment. The zSpace system also uses encoded tracking within the glasses, and this allows for an object's spatial positioning to be customized based on how the user is moving his or her head. The sensation that the objects move in relation to how a visitor's head moves, provides the visitor with a feeling that they are not only interacting with the zSpace system but also that the zSpace system is interacting with them.



Once the 3D model is finalized it is uploaded to the zSpace equipment. Visitors will use 3D glasses that have a series of embedded sensors that provide a perception of depth, making the object seemingly come to life and a stylus pen to interact with an object and manipulate it to get a 360-degree view. Background photo of Acoma Pueblo, curtesy of Museum of Texas Tech photographer Bill Mueller

It is crucial to keep in mind that adding this type of technology to an exhibit space should always act as a tool of enhancement rather than replacing a traditional exhibit experience. Our goal is not to replace the original object, but to enhance the personal experience that visitors can have with objects in the museum.

To achieve this, the Museum's Education Division is creating corresponding activity guides to correlate with each object and culture. These guides, which are available with the object on the zSpace program, prompt users to interact with the objects in specific ways that allow users to learn more about historical and cultural significance.

The guides include background information, and true/false, multiple choice, and open-ended questions regarding the possible symbolism of patterns and stylistic choices. The user is then shown the correct answers, creating educational scaffolding that builds off of a user's knowledge to create an overall deeper understanding of the content. Using the guides is optional, and visitors can choose to use only parts of the guide. The element of choice as to how a user interacts with the objects and activities is vital in helping to achieve the project's goal of creating personal connections between our visitors and our collections. We believe this is the start to a new relationship between our visitors, our collections, and technology that will spark curiosity, create active learning, and help enhance the Museum's educational services to our public.

Danielle Marshall, Education Division intern and graduate student in the Heritage and Museum Sciences program.

On a day-to-day basis, the majority of work within a museum is collection-driven, yet we must remember that it is our responsibility to inspire curiosity and create active learning for our visitors. The zSpace incorporation will open the possibilities of using augmented and virtual reality experiences within all of the collection divisions of the Museum and will provide a unique opportunity to interact with treasured artifacts in an innovative and exciting way.

Historic Pullman Train Car

Provides Hands-on Experience for Students

By ***Sally Logue Post***

A 1920s-era Pullman train car that once served as a cotton business office, and also hosted U.S. political leaders, is now providing a hands-on educational experience for Texas Tech Heritage and Museum Sciences students.

The Pullman sleeper car, now located at the Bayer Museum of Agriculture in Lubbock, was owned by the Underwood family. Arch Underwood purchased the car from the Pullman Company and brought it to Lubbock in 1950 to use as a traveling office for managing the family's cotton warehouse and compress business. It also served as transportation for family vacations. The car is much like the one seen in the 1959 movie "Some Like it Hot," starring Marilyn Monroe, Tony Curtis, and Jack Lemmon.

The Underwood family owns the Trinity Company, which is made up of cotton warehouses across the South Plains. From 1950 to around 1960, the Underwood Pullman car was used primarily as a traveling business office that provided easy access to the far-flung parts of the company. Along with the day-to-day business operations, Arch Underwood, who ran the company, welcomed many political leaders to his traveling conference space. While Underwood never ran for office, he did use his political connections to ensure the cotton industry thrived in West Texas. Among those hosted on the car were Senator Lyndon Johnson, U.S. House Speaker Sam Rayburn, and U.S. House Ways and Means Chairman George Mahon.

Underwood would also use his connections with the Santa Fe Railroad to hook the car up to trains traveling across the country to take his large family on vacations. The Pullman is designed to sleep 22 people, with seats converting to lower births and pull-down compartments making upper births. It was a pleasant way to travel long distances with grandparents, children, and grandchildren all engaged in a prolonged family reunion on their way to Colorado or Disneyland or other places that suited their whimsy.

But, by around 1960, trains had changed, with engines and cars becoming much lighter. The Underwood's Pullman car weighs in at 80 tons, making it much too heavy for contemporary engines to carry. When the car outlived its functionality, it was parked on a rail siding near the Trinity warehouse at 26th Street and Avenue C in Lubbock. And that's where it sat, virtually untouched, until 2016.

When the Lubbock Heritage Society became aware of this 1925 classic Pullman sleeper, the organization began fund-raising to move and preserve the car.

The preventive conservation class in the Museum's Heritage and Museum Sciences master's degree program worked on identifying the materials in the Underwood Pullman car and began developing recommendations on the continued care of the textiles.

"We were able to interest Louise Underwood, Jane Henry, and other family members, as well as outside individuals, to fund moving the car to the Bayer Museum of Agriculture," said Pam Brink, president of the Lubbock Heritage Society, an organization dedicated to historic preservation. "That was not an easy task because there were no more train tracks other than what the car sat on."

So, in April 2016, two giant cranes lifted the car onto a truck to carry it through the streets of Lubbock from 26th Street and Avenue C to its new home at the Bayer Museum, located just east of Mackenzie Park.

"It was quite an operation," Brink said. "The car is huge, and we had to make sure we could make the turns we needed to avoid the railroad bridges and all the utility wires."

The Bayer Museum is a natural new home for the car given its connections to the area's cotton industry. A lot of work was needed both inside and out to make the car available to the public.

While the Lubbock Heritage Society did a lot of research on windows, paint colors, and historical artifacts to bring the car back to its original beauty, they knew they needed help with the interior textiles.

"Nothing had been touched in decades," said Brink. "We were lucky we're in a dry climate, so there wasn't a lot of mildew. Some rust, yes, but we could restore those areas. We saw there were a lot of original linens and textiles, some with the word Pullman woven into them."

That's where the Museum of Texas Tech University enters the Underwood Pullman car's saga. The Heritage Society reached out to Marian Ann Montgomery, the Museum's curator of clothing and textiles, for help with the textiles.

"Dr. Montgomery met with the society in the fall of 2017," said Nicky Ladkin, associate chair and an instructor in the Museum's Heritage and Museum Sciences master's degree program. "While she was interested, it was a bigger project than her area had the capacity for, so she approached me about taking on the work as a class project."

In the spring of 2018, Ladkin's preventive conservation class began working to identify the materials in the car, do some light cleaning, and begin developing recommendations on the continued care of the textiles. The project has turned into a multi-disciplinary effort within the Museum of Texas Tech University.

"Dr. Montgomery has worked with one of our students to help identify some of the fabrics so we'll know not only how to work with them, but also how to make recommendations for future care," said Ladkin.

The intent is to return the car, as near as possible, to its original state and open it to the public as a permanent exhibit.

"One issue we've found is that where the fabrics have been exposed to direct sunlight from the car's windows, the material has faded," said Ladkin. "That will continue to be an issue, so we'll make recommendations on how to minimize future damage as well as how to clean and care for all the textiles in the car going forward."

Jessica Morris continued working on the Underwood Pullman Car project after the preventive conservation class ended, taking on the project as a summer practicum.

While the class made great strides during the spring semester, the work was not finished. Jessica Morris, a first-year student from San Antonio, was part of the class and chose to continue working on the project as a summer practicum.

Morris began the master's program during the spring 2018 semester. Before coming to Texas Tech, she earned an undergraduate degree from the Kansas City Art Institute and was planning on a career in art therapy, which led her to graduate school in Santa Fe. But

working in a library and as a gallery and art supplies coordinator shifted her thinking.

"I found the jobs I was doing more aligned with what I wanted out of a career; I was more interested in archival or collections care positions," Morris said. "I decided art therapy didn't feel quite right, so I looked up the schools in Texas with archival studies and museum science master's programs, and found that the Museum of Texas Tech program was the best fit for me."

Her first experience with textile preservation has been eye-opening.

"I have learned quite a lot," she said. "I wasn't aware of how much care textiles need - the difference there is between types of material and the specific care for each type."

Among the many details Morris has had to master included how to package the textiles. With the help of Meg Reel, assistant collections manager of ethnology in the anthropology division, Morris is learning how to create boxes and how to house specific materials properly.

She's also spent a lot of time researching Pullman cars on the internet and through interlibrary book loans. She's found four other cars of the same era in the Texas Hill Country area. She and Ladkin hope to communicate with the owners of those cars and share information.

"That's important in the museum field," said Ladkin. "We hope what we have learned can help someone else, and maybe they have information we can put to use in this case."

Not only has the Underwood Pullman car been a hands-on learning experience that lends value to the students' education, but it is also providing needed materials for the Lubbock Heritage Society and the Bayer Museum of Agriculture moving forward.

The textiles above are called bolsters. They are sturdy, supportive pillows that were used for arm or back support. The bolsters came from the seats that converted to bunks. The class assessed the condition of the bolsters. The one at the far left has faded due to exposure to light for many years, while the bolster next to it is close to the original color.

Nicky lLadkin works with the preventive conservation class on the Underwood Pullman car project.

"We hope we can put together recommendations so the Bayer Museum can meet their goal of opening the car to the public, but also minimize any further damage to the textiles," said Ladkin.

The Underwood Pullman car project isn't the first time the Bayer Museum of Agriculture has worked with Ladkin and one of her classes. A few years ago, the museum was moving to its current location and had dozens of boxes of archival material that had not been inventoried.

"My class formed a human chain and moved between 70-to-90 boxes. "Once we got the material out, we were able to inventory the material and move it into the new facility."

It is experiences such as these that help the Museum's master's program stand out by giving students the hands-on experience that makes the theory they learn in a classroom come to life.

THE MAKING OF AN EXHIBITION

By ***Sally Logue Post*** *and* ***Daniel Tyler***

Exhibitions at the Museum of Texas Tech University look incredible when they open to the public. But what visitors never see is the weeks-long process and hard physical work required to present an engaging exhibition.

The *Red That Colored the World* exhibition is a prime example. On loan from the Museum of International Folk Art in Santa Fe, New Mexico, this exhibition explores the history and widespread use in art and textiles of cochineal, an insect-based dye source for the color red.

Along with *The Red That Colored the World*, the Museum is presenting two companion exhibits. *Ladies in Red* draws on the Museum's extensive clothing and textile collection as well as loaned garments. *Red, Hot & Quilted* comes from artists of the Caprock Art Quilters group.

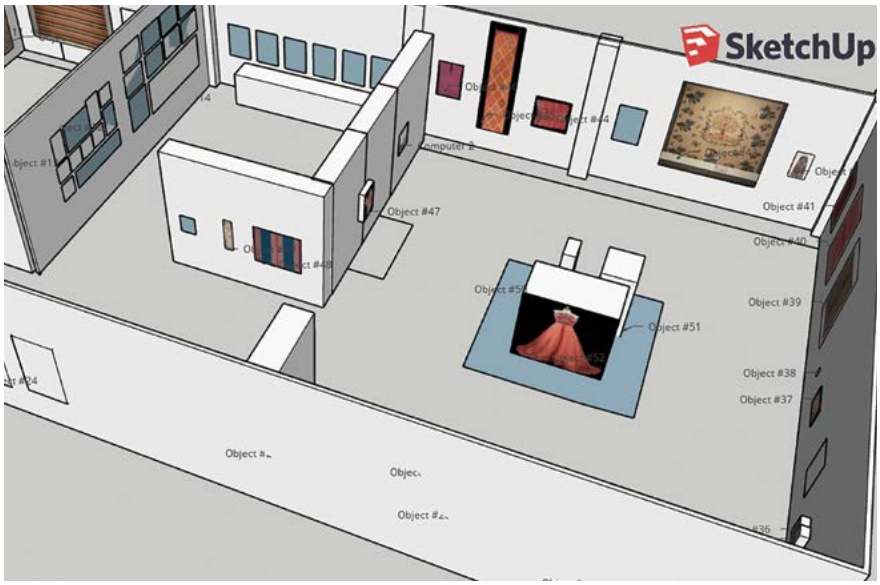
Exhibits Manager Andy Gedeon and his three-person team are responsible for putting up and taking down every exhibit in the Museum. M Magazine gives you a look behind the curtain as they build three major exhibits while continuing to plan for the next installations.

Watch a video of the behind the scenes work that went into installing *The Red That Colored the World* on the Museum's website at museum.ttu.edu.

Ladies in Red
Sept. 11, 2018 – Feb. 3, 2019

The Red That Colored the World
Sept. 18, 2018 – Jan. 17, 2019

Red, Hot & Quilted
Sept. 27, 2018 - Jan. 17, 2019



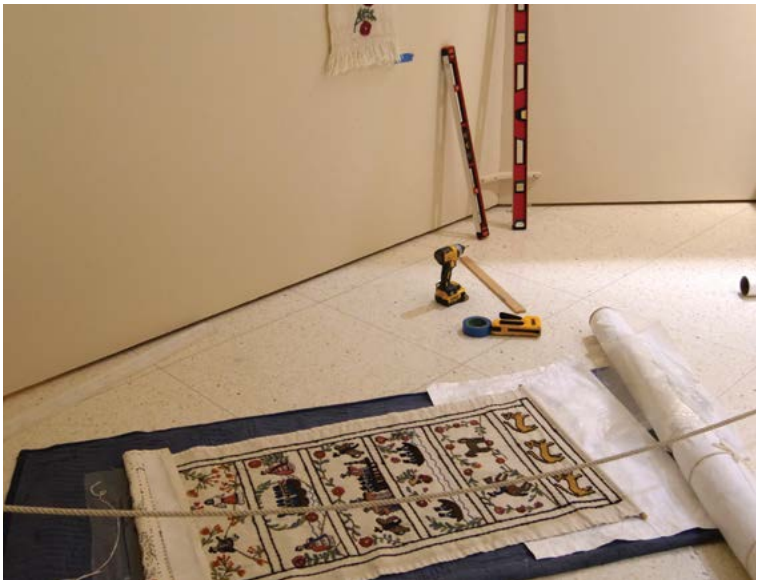
The work on an exhibition begins weeks ahead of its opening. The first step is developing a floor plan. A computer-assisted design (CAD) software is used to create a model of the exhibition to work out the best layout and traffic flow plan. The Red That Colored the World was the most complex model of the three exhibitions.

Before any of the three Red-related exhibitions were installed, the galleries received a makeover. The teams built temporary walls, constructed platforms and painted the walls colors that would complement the objects – things that happen with almost every exhibition. The Red That Colored the World occupies two galleries.

As the team prepared the galleries, the dresses and accessories that make up Ladies in Red were fitted onto manikins in the Clothing and Textile Division workroom. Once the platforms were ready, the dressed manikins were moved into the Main Gallery.

Once Ladies in Red was open, the exhibits team turned their full attention to The Red That Colored the World. The crates containing the more than 50 objects and accompanying display cases for the exhibit had arrived weeks before. As the objects were unpacked, a careful inventory was taken to document not only that each object arrived in good shape, but also to remind the exhibits team how to repack the objects.

When the team is ready to unpack, the crates are moved from storage into the galleries. While the scene looks chaotic, everything is carefully placed near where it would be installed. The walls are measured and marked before each object is installed.



Hanging this tapestry, for example, was a two person job. It was first carefully laid out on a mat, the wall was measured to ensure there was enough width for the object and it would hang at the correct height, and then the tapestry was hung.

When the team finished installing The Red That Colored the World, they began work on the third of the red-themed exhibits. Red, Hot & Quilted is made up of red-inspired quilts created by members of the Caprock Art Quilters.

The Museum's exhibits team puts the final touches on Red, Hot & Quilted. The team is made up of (from left): Ian Babowicz, Andy Gedeon, Carolina Arellanos, and Bill Perkins.

The RED That Colored the World

Red is the color of power and passion. Its brilliant hue has inspired artists' imaginations and seduced viewers for millennia. And we have a small bug to thank for the bright color.

The exhibition, *The Red That Colored the World*, combines new research and original scholarship to explore the history and widespread use in art of cochineal, an insect-based dye source for the color red.

The exhibition follows the precious dye and its use in art from Mexico to Europe to the U.S. and beyond. Artists and dyers for centuries strived to find the color source to rival the best reds of nature and to express the spirit, symbolism, and sustenance of life. Their quest ended in the Aztec marketplaces of 16th-century Mexico, where Spanish explorers encountered the American cochineal bug. The bug, found in the southwestern U.S., Central, and South America, created an unparalleled range of reds. The red cochineal dye was the brightest and most colorfast of anything available in the world at the time. The desire for this color made Spain rich with its monopoly on the dye.

The Red That Colored the World highlights more than 60 objects including textiles, sculpture, paintings, decorative arts, and clothing. The objects reflect the international uses of color, revealing its role in the creative process, and the motivations of artists in their choice of materials.

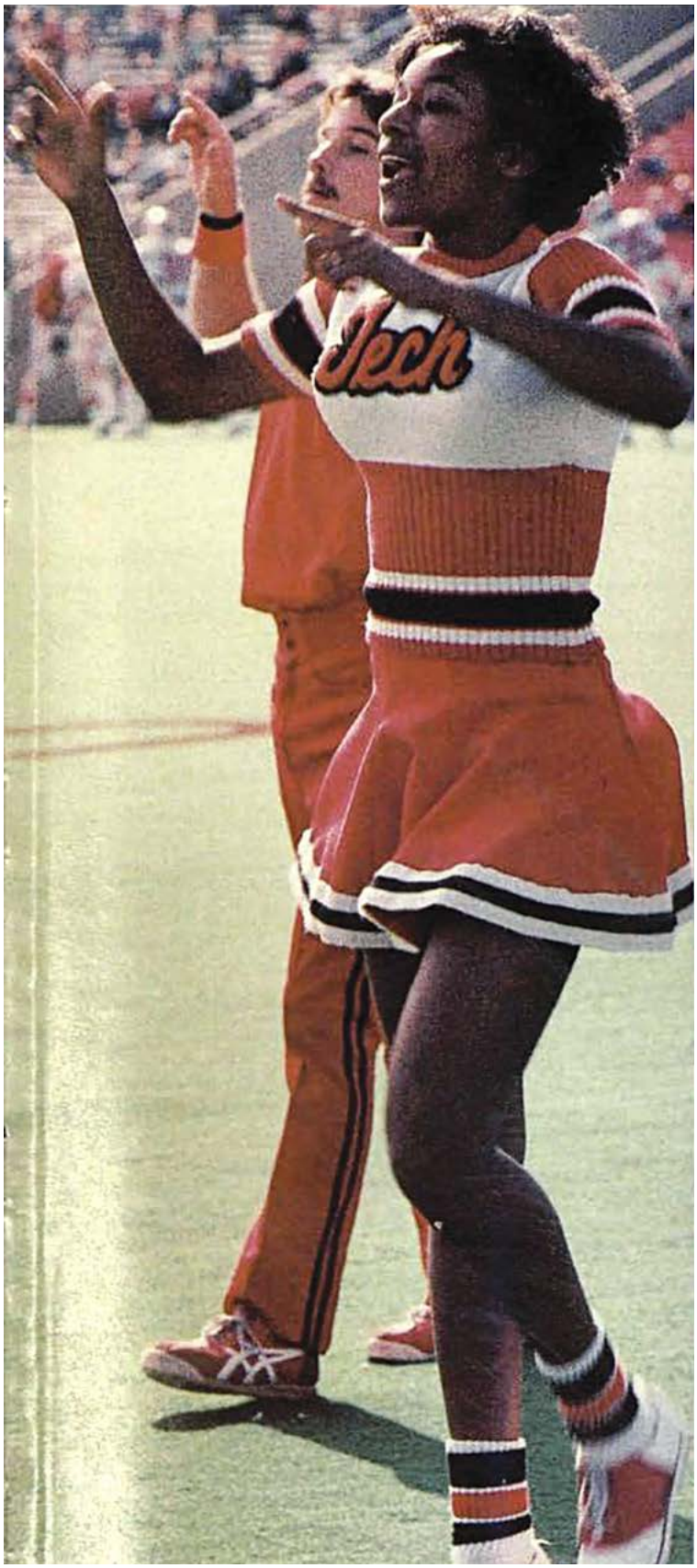
Pre-Columbian weavers used cochineal. So did the painters El Greco, Rembrandt, and Van Gogh. Navajo weavers of the 18th- and 19th-century American Southwest followed suit, as did 20th century-Spanish design icon Mariano Fortuny.

Synthetic dyes eclipsed natural sources in the late 19th century, but cochineal's cachet never completely waned. The exhibition follows the story to today, where cochineal and the color red remain hot commodities in cosmetics and commercial products, contemporary art, fashion and design, and other expressions of popular culture.

Nina Arroyo Wood, Altar cloth and cochineal dyed wool yarn, Santa Fe, New Mexico, 2013. Courtesy Museum of International Folk Art. Photograph by Addison Doty.

EDITOR'S NOTE: The Red That Colored the World, organized by the Museum of International Folk Art in Santa Fe, NM and circulating through GuestCurator Traveling Exhibitions, has been made possible in part by a major grant from the National Endowment for the Humanities: Celebrating 50 Years of Excellence. Any views, findings, conclusions, or recommendations expressed in this exhibition do not necessarily represent those of the National Endowment for the Humanities. The Red that Colored the World and the Ladies in Red exhibits are funded in part by the Helen Jones Foundation, Inc., the CH Foundation, and the Museum of Texas Tech University Association

"Octopus" Bag, Taltan Tribe, Northwest Coast, United States, c. 1860-1870. Collection of the Ralph T. Coe Foundation for the Arts, NA 1119.



Texas Tech cheerleading uniform from 1979.

Raider Rose made her first and only appearance during the 1975 Texas Tech – SMU football game. Photo courtesy of the Southwest Collection/Special Collections Library.

Raider Rose's uniform, made by Texas Tech seniors Ruth Foreman and Ann Grabhorn, is part of the Museum's Clothing and Textiles Collection.

THE SPIRIT OF THE *LADIES IN RED*

By ***Marian Ann J. Montgomery, Ph.D.***

Curator, Clothing and Textiles Division

The plans for mounting *The Red That Colored the World* exhibit lent themselves perfectly to planning a companion exhibit of red garments. Although the Museum's collection holds garments worn by both men and women, the title of the popular song "Lady in Red" floated to the surface and seemed ideal for the exhibit.

Focusing on women also provided the perfect opportunity to showcase the cheerleading uniforms that the Museum holds. While one cheer squad is co-ed, it is only the women's uniforms that will be represented in *Ladies in Red*. In the process of putting together the exhibit, visiting with the staff that directs the spirit squads on campus was essential.

This led to delightful meetings with Stephanie Rhode, spirit program director, and Bruce Bills, cheer coach, in which they shared their vision for the squads and how they select the garments that are worn today. They said they consistently endeavor to provide a wholesome and safe environment for the students participating. The uniforms they select for the spirit squads have a clean, simple look and a Double T emblem that is recognizable from the top of the stands. Their concern for the squad and the need to maintain a wholesome environment around the students on the squad is very clear.

SPIRIT HISTORY

The wife of the first football coach, Eli Freeland, came up with the Matadors as the mascot because the land of Lubbock reminded her of the high plains of Spain. The original architecture for the then Texas Technological College is also drawn from a university in north-central Spain. The Spanish Renaissance-style continues to dominate Texas Tech architecture.

The Red Raider team name came from an article written by a sports writer in New Mexico in 1936 when Tech held a football camp there. The headline read "The Red Raiders of Lubbock Storm across New

Mexico." By 1937 the Texas Tech athletic teams were officially the Red Raiders.

On exhibit for *Ladies in Red* will be cheerleader uniforms from the earliest days of the university to the present. In the exhibit is a corduroy outfit worn in the 1920s, two different outfits from the 1960-70s era, one worn from 2002 to 2006, and one worn from 2006 to the present. Bruce Bills recently donated the two most recent uniforms specifically so they could be in this exhibit. The uniforms, used from 2002 to 2006, are made up of a crop top and skirt with Red Raiders on the back of the top.

Although sometimes still worn at away games, the uniform was retired in 2006 when a newly arrived cheer coach wanted a cleaner line and because Red Raiders could not be seen all the way at the top of the stadium. Bills also donated a current uniform, which consists of a full-length top and skirt with the Double T emblem on the top.

Raider Rose co-creator Ruth Foreman, right, and Marian Ann Montgomery, Museum clothing and textiles curator, check out the Raider Rose outfit now on display in the Ladies in Red exhibition.

RAIDER ROSE

While reviewing the spirit outfits in the Museum's collection, we came upon the uniform for Raider Rose. Not widely known, even among Texas Tech grads, she has an interesting history, which her creator shared with the Clothing and Textiles division team in a phone conversation. In 1975, Ruth Foreman and her friend Ann Grabhorn were seniors at Texas Tech. Ruth was an accomplished seamstress having won all sorts of honors through her 4-H activities. She had friends in the Saddle Tramps, the all-male spirit organization. In the summer of 1975, they asked her to make a new uniform for Raider Red to replace the one that was worn out. She did so. Afterward, Ann and Ruth began to talk about how there should be some way for the women of Texas Tech to show their support of the athletic teams in the way that the men did through the Saddle Tramps.

Ruth Foreman served as an officer of the Residence Hall Association in her senior year, and that role came with a private dorm room. Ruth and Ann both lived in Weeks Hall. Since Ruth didn't have a roommate, they could use her room to create their vision of a female Raider Red that they called Raider Rose. So, working in secret behind the closed door of Ruth's room, they created Raider Rose. They made the outfit to fit Ann.

A red bandana print blouse was purchased and cut to fit the over-sized female paper mache head, much like the Raider Red head worn by the male mascot. The vest and skirt were of black corduroy. Ruth embroidered "Rose" on the front of the vest and embellished the back with a giant "T" with a rose wound around it. The paper mache head was created using cotton balls glued over a balloon. They made her a matador style hat with dangling ball fringe around the edge.

They planned to make a point that women needed a place, and the young ladies thought this was a humorous way to make the point without making people mad. On the day of the SMU game, which was played at Jones Stadium, Ann dressed in the outfit

and they sneaked her onto the football field. According to Ruth, the Saddle Tramps thought it was something that some of their members had done and thought that there was a man in the costume. A Saddle Tramp member always wears the Raider Red costume. No one realized it was a woman in the costume until Raider Red went over and took her hand to take her onto the field with him.

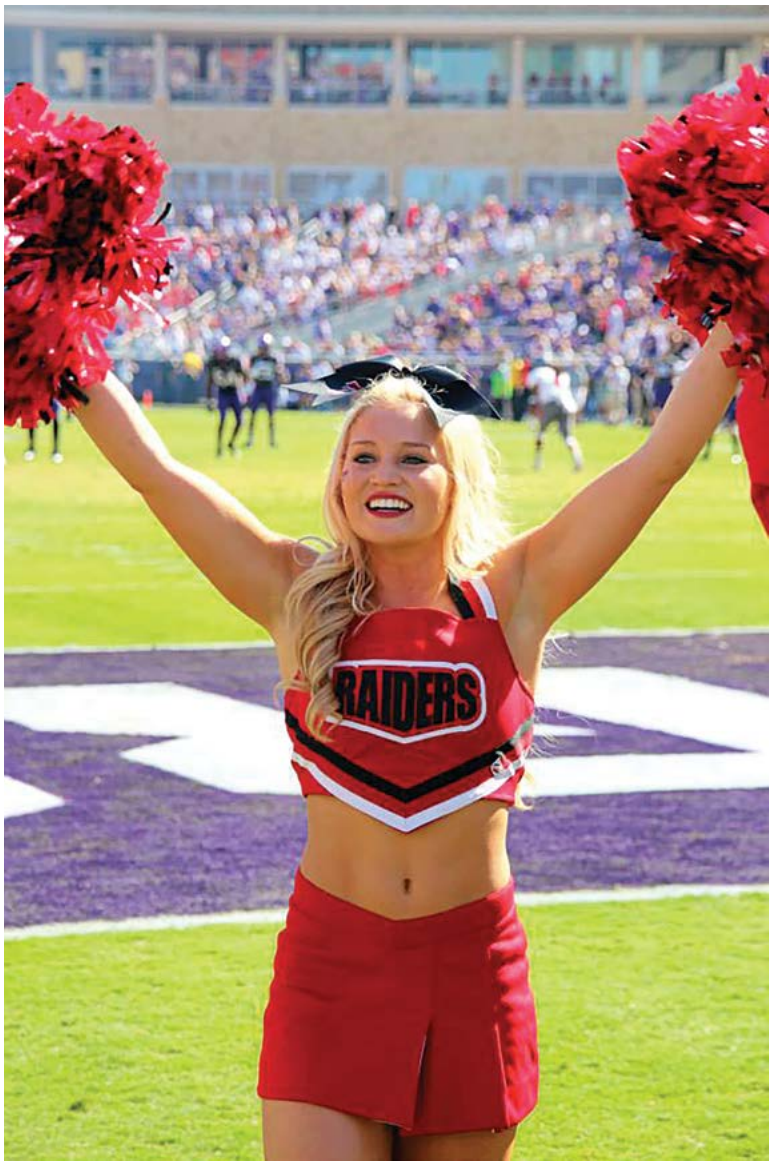
Ruth recalls that it was a one-time thing and that the crowd loved it, although under the harsh stadium lights the cotton balls in the paper mache head tended to make Rose look as if she had acne. Tech won that game and Raider Rose won many friends including a group of young women that Ruth says were inspired by Raider Rose and the subsequent newspaper article on her to create a female equivalent of the Saddle Tramps called the High Riders. Ruth recalls that she and Ann were rebels.

"We were not really women's libbers, we just wanted to make a point that the women needed a place there, too, and we thought this was a fun way to make a point without making people mad," she said. "People did find it humorous, and we did make our point."

TOP SPIRIT SQUADS

The growth of the spirit groups at Tech has been significant. Bills mentioned that the talent pool that comes to Tech has increased significantly in his time here. Currently, there are students from 17 states represented during the spirit programs. The squads make dozens of public appearances each year in addition to cheering at Texas Tech sporting events.

The men and women who make the cheer and dance squads are at the top of their game. In 2017, the co-ed squad won the National Cheerleading Association Division 1 Large Co-Ed National Championship. The Pom Squad also took home national championships in the 2017–2018 Division 1A Jazz competition, and in 2018, they took top honors in Division 1A Pom.



Texas Tech cheerleading uniform used from 2002 to 2006.

Documents, Documentation and Documentary

By ***Jorgelina Orfila, Ph.D.***
Associate Professor, School of Art and
Francisco Ortega, Ph.D.
Associate Professor, School of Art

When everything posted on the internet is considered a "publication" and Wikipedia, a crowd-sourced online encyclopedia, has become a primary reference tool; when everyone can have a YouTube channel streaming their opinions; and when sound and video are easily altered with "over the counter" software, how do you determine the reliability of visual and written materials on which we base our understanding of facts and events?

Most especially in the visual arts, it is crucial that art historians-in-training—and students in general—learn techniques and methods to assess the credibility of sources and documents. Since, as the saying goes, "an ounce of practice is worth more than a ton of theory," we are experimenting with a new course that uses the Museum's collections to teach students how to record objects and events, how to create art historical documents, and how to understand the work of contemporary scholarly research.

The advantages brought to scholarship and research by new digital media include widespread dissemination of documentary resources held in difficult-to-access repositories or archives, circulation of high-quality digital renderings of original archival sources and works of art, searchable online databases, and almost instant communication with distant institutions and experts. But these exceptional resources have been offset by a parallel problem, specifically how to discriminate between vetted, or reliable, and unreliable sources.

How does a scholar sift through the myriad of opinion-based publications or digital postings or the vast dissemination of digitally altered written and visual documents? Art history students, especially those attending universities situated far from art centers, learn about the world of art through images on the internet that have been changed or adapted a countless number of times.

Because of the almost endless streams of internet information, students rarely acquire the skills to work in archival repositories, private or public collections, or museums. Rarely taught, students lack the knowledge and experience in how to examine and document original works of art, or how to investigate or record artistic events, or how to interview artists or other members of the art world. The challenge is how to reacquaint students with physical or material events, objects, and people, not just their virtual incarnations.

Based on an analysis of how new media is shaping the practice of art history, we (Jorgelina Orfila, an art historian, and Francisco Ortega, a graphic designer) created the course Documents, Documentation and Documentary as an introduction to the discipline's research methodologies. The course will familiarize students with the use of new technologies for the study of art history and explore ways to compensate for the effects of "mediatization," which is the shaping and framing by digital media of works of art and individual artists. The course will be applied or a hands-on, practical exploration of the nature and value of art historical documents through the creation by students of short video documentaries on artists and artworks in the Museum's Artist Printmaker /Photographer Research Collection. Students of contemporary art history, as well as those interested in the art of the past, will acquire practical skills such as how to document artistic events, either performance or participatory events, art installations, historical sites, and interviews, as well as learn effective techniques to study and digitally record art objects in public or private collections.

Documents, Documentation and Documentary takes advantage of the Museum's unique Artist Printmaker/Photographer Research Collection (AP/RC) curated by Peter S. Briggs, Ph.D., the Helen DeVitt Jones Curator of Art. The AP/RC concentrates on art and artists who have had a demonstrable impact on the artistic environment of arid and semi-arid regions west of the Mississippi River. More than 12,000 artworks in the AP/RC represent in depth the work of 20th and 21st-century artist printmakers and photographers. The collection encompasses original photographs, prints, proofs, states, editions, mylars, drawings, print matrices, and archival resources from hundreds of artists, offering unparalleled resources for students in this class.

The AP/RC has more than 12,000 original works of art from hundreds of artists across the western U.S. that are available to students, faculty, scholars, and the general public. The AP/RC focuses on original prints and photographs but also includes printing matrices, drawings, archival materials, and much more. The collection is available by appointment. Email Peter Briggs at peter.briggs@ttu.edu or call (806) 834-4255. Photograph courtesy of the MoTTU Art Division.

All art has the potential of being a document, as works of art represent cultures, individuals, and societies, all from a particular place and made at a specific time. The Oxford English Dictionary notes that the word document applies to anything that is regarded as evidence. In practice, any object—depending on its context—might be regarded as a document. As Johanna Drucker, a scholar of digital aesthetics has aptly commented: "a document is basically a fragment whose meaning varies with how it is read or perceived."

Students in the new class will contend not just with the techniques of creating documents but also with the limitations of documentation. Integral to the interview process, for example, is the ultimate question, "What is the meaning of a specific work of art?" How does one consider the artwork as a document, as something that attests to or indicates a culture, or characterizes an individual artist? In this context, recorded interviews with artists become documents. Artist interviews, as well as artist's biographies, persist as romantic and expressive records, subjective reflections that position an artist as the source of an

artwork's meaning. Students will grapple with this problem and the reality that each document is limited, a fragment of an unknown whole.

The use of photography, including videography, for the study of art has dramatically influenced documentation. The widespread availability and distribution of photographs at the end of the 19th century, exponentially increasing to the present, solidified the academic institutionalization of the discipline of art history. As an "aide memoire," photographs advanced our ability to compare and contrast works of art and to order them stylistically regardless of their present location or the time they were created. Today, photographs are so pervasive that public and scholarly viewers forget to question their evidentiary value, how they condition the understanding of works of art, and how they guide research decisions. For example, Salvador Dalí's famous 1931 painting of limp watches, "the Persistance of Memory," is considerably smaller at 9.5-by-13 inches than many of its photographic reproductions in posters and books. Moreover, the colors of the voluminous reproductions published on the internet vary wildly. As a result, faced with an original artwork our perceptions involve mental comparisons with reproductions we see on our computer screen or cell phone. The current challenge is to develop awareness of works of art as concrete, material objects and not just as a programmed arrangement of 0s and 1s displayed on a computer screen. Every photographic document is doctored and most often an inadequate replacement for an original work of art.

Former Director of the School of Art at the University of Arizona, Andrew Polk's archive is one of the largest in the AP/RC. He is one of the artists that students can interview for their project. Photograph courtesy of the artist.

Melanie Yazzie is one of the artists that students can select for an interview. She directs the printmaking program at the University of Colorado in Boulder. Yazzie was one of the first artists to commit to the AP/RC by donating hundreds of artworks. She continues to send newly created work every year.

Images or reproductions representing works of art are used as decorations, illustrations, souvenirs, or as computer desktop wallpapers. When used for research or study purposes, or as evidentiary material in scholarly contexts, these images become documents and support hypotheses or interpretations based on the information they provide. But even when scholars use documents, truth, if such exists, is elusive. For example, the film recording the assassination of President John F. Kennedy accidentally taken by Abraham Zapruder in 1963 documents the precise moment when the president was hit by bullets. Despite the objective legitimacy of these moving images, they are used as proof for various conflicting theories about what happened that fateful day. Similarly, scholars use Vincent van Gogh's paintings as well as letters he sent to his brother Theo, friends, and family to support incompatible interpretations of the artist's artworks.

Students in the class, Documents, Documentation and Documentary, will contend with these issues by creating a short documentary on artists whose works are in the Museum's collection. The project will allow the students to practice all the phases of an art historical research process and to create and work with evidentiary materials. As preparation for video and audio interviews, students will study the works of art in the Museum's galleries and storage vaults. These tasks will be complemented by research on written

sources about the artists in the library and on the internet. The creation of their video documentaries will involve evaluating the qualities of reproductions of original artworks, as well as selecting images that best support their documentary's interpretation. The writing of a script for the video will demand that students harmonize artists' voices with those of critics, historians, and curators who have interpreted the works of art. This practice will advance students' understanding of the evidentiary value of textual and visual documents and teach invaluable lessons about how techniques and contexts determine and shape meaning.

Kathryn Polk, standing beside her press, has more than 150 original artworks in the AP/RC's collection. Polk is available for interviews by the students. Photograph courtesy of the artist.

Gesine Janzen, one of the artists in the AP/RC collection, printing in her studio in Montana. Student may choose to interview her for the project. Photograph courtesy of the artist.

"Drs. Orfila and Ortega have developed an exceptionally dynamic class. Their students will certainly examine first hand many artworks in the Museum's AP/RC collection. This type of thing happens every semester. But this class goes much further by focusing on the methods and practice of art history in the creation of new and original documentation. The relevance of the documents these students create will persist for many, many decades. The students will create new knowledge and use the Museum's collections to do so – a giant and innovative step forward."

Peter S. Briggs, the Helen DeVitt Jones Curator of Art at the Museum.

WHY FROGS DON'T GET FAT:

PREDATORS, FEAR, AND FEEDING IN THE WILD

By ***James A. Carr, Ph.D.***
Professor, Texas Tech Department of Biological Sciences
and
Breanna N. Harris, Ph.D.
Research Assistant Professor, Texas Tech Department of Biological Sciences

Imagine that it's the middle of the night and you are surrounded by predators. On all sides, everywhere. You think that you can hear them, and maybe you can smell them, but it's dark, and you can't see them. You think that you can see their eyes, but they keep moving. Are they close or far away?

What would you do? Would you hide? Or run? Or freeze? What if you hadn't eaten all day, and you needed to search for food? Would you settle for the easiest food that you could find, even if it wasn't very good? Or would you spend more time searching for food, perhaps risking your life?

These are the situations most animals face every day. Surrounded by things that want to catch and eat them. And it affects everything that they do, especially how, where, and when they eat. Because when they are eating, prey animals let their guard down and are more vulnerable to being caught and eaten themselves.

In the exhibition *Why Frogs Don't Get Fat: Predators, Fear and Feeding in the Wild*, we examine what it is like to live in the real world of nature. To be faced with finding food when everywhere you turn there is something that might eat you. Predators can make animals scared and very nervous and can influence the behaviors necessary for survival. Similarly, the changes that happen when we are scared and nervous can affect how, what, and where we eat.

A juvenile little blue heron (Egretta caerulea) eating a frog in the Everglades National Park. Photo by Anne Jacobs.

Why Frogs Don't Get Fat: Predators, Fear, and Feeding in the Wild

On view through Feb. 4, 2019, in Leonardo's Kitchen

Predators

Predators may be specialists and very good at hunting certain kinds of animals or may be generalists and able to catch lots of different animals to be eat. Some types of predators, like a cheetah or lion, can run and jump quickly to catch their prey. Other predators, like crocodiles, sit and wait for unsuspecting prey to roam along accidentally.

How do predators detect their prey? Unlike humans, they can't just go to the grocery store or a restaurant. They use vision, smell, sound, vibration, temperature, and electromagnetic sensing to detect prey. Some predators use all of these senses; others use only one. Toads and frogs use only their eyes to detect prey, but not just anything will trigger a frog to snap its tongue and catch the prey. For example, putting a dead fly in front of a frog will elicit no response, but if the fly is moving the frog will orient toward the fly by turning its whole body, snap its tongue and catch the fly, and then wipe its mouth with its right forelimb.

Some predators such as snakes use infrared vision to "see" the body heat of their prey. Mammals, birds, and humans are warm-blooded meaning our bodies generate heat. Some snakes including vipers, pythons, and boas have pits in their faces that detect body warmth. These pits contain special proteins that are the same proteins that humans use to taste hot and spicy things like mustards, horseradish, or wasabi but not chili peppers, which are detected differently.

Prey

Prey animals have evolved strategies for maximizing defenses so that they don't become food for other animals. Many animals can blend in with their background so that they are not seen. Rabbits and deer flash their white tails to confuse predators.

Prey animals can detect predators using the same senses that predators use to detect prey. Vision, smell, except apparently in birds, and sound all are used to detect predators. From birth, animals may have evolved cells in their brains for detecting predators.

A frog may never have encountered a snake, yet still, carry out the proper defensive behaver of lowering its head and sticking the arms out making it is harder for a snake to swallow. This is because frogs, and many animals, in fact, are born with the innate brain mechanisms needed to detect and respond to predators before they even encounter one. Such innate anti-predator defenses are evolutionarily adaptive because they increase the chances that the animal will survive to reproductive age.

Fear

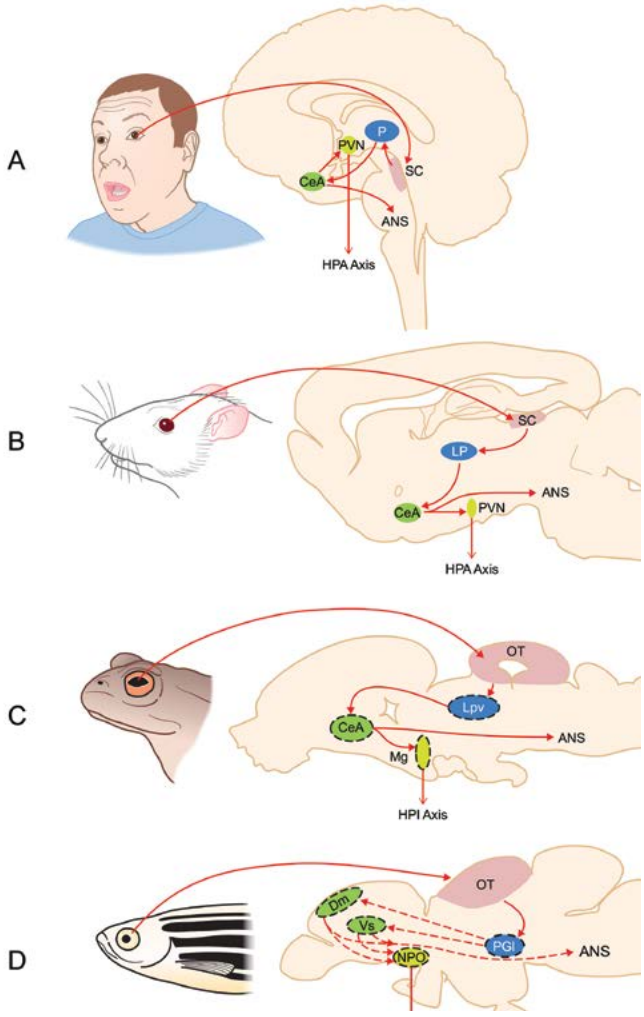
No matter how young or old we all have experienced anxiety and fear. For example, if you are watching a scary movie on television, you most likely are entirely focused on every sound and image on the screen. Subtle cues in the music or images can give you the sense that something may happen soon. This is anxiety. The music that accompanies the Wicked Witch of the West in the "Wizard of Oz" will cause anxiety. When the wicked witch finally appears, you may experience a different emotion called fear. You may choose to hide your eyes, leave the room until the witch leaves, or hide under the couch (as one of the authors of this exhibit did when they were a child).

Prey animals experience anxiety and fear on a daily, and sometimes minute by minute, basis resulting from constant exposure to predators. This concept has become known as the ecology of fear.

Animals have experienced fear, anxiety, and stress for hundreds of millions of years. Your dogs, cats, pet turtle, and goldfish experience fear, anxiety, and stress much the same way that you do, although not necessarily as a conscious process. In other words, these animals experience fear, anxiety, and stress but are not aware of it to the degree that humans and some other mammals are. This is because our brains are simultaneously similar and very different from that of fish, birds, and even other mammals. Fear and anxiety are processed by a number of ancient brain areas including the amygdala, habenula, and septum.

Your pet has these same parts of the brain, and they operate in much the same way in all non-mammalian vertebrates. However, in humans and other primates, there are billions of connections between these fear and anxiety areas and our brain cortex, where we associate things like fear and anxiety with other memories, thoughts, and sensations, much more so than other animals do.

Even though humans don't experience predators on a daily basis, and your pet fish isn't likely to be eaten by a bigger predator, we still maintain these fear and anxiety pathways. Activating these fear and anxiety pathways inappropriately, when there isn't anything to worry about, can lead to anxiety disorders, depression, and post-traumatic stress disorder.



Organization of subcortical visual pathways triggering fear in humans (A), rodents (B), amphibians (c), and fish (D). Image from Carr, J.A. 2015. I'll take the low road: The evolutionary underpinnings of visually triggered fear. Front. Neurosci. Oct 29; 9:414. doi: 10.3389/fnins.2015.00414.

A special case in which fear goes wrong is called a phobia, in which we inappropriately associate a neutral stimulus with fear. There are phobias about height (acrophobia), spiders (arachnophobia), open spaces (agoraphobia) and many more. These are irrational fears, where our minds play tricks on us by thinking that something harmless is harmful. Our normal fear and anxiety pathways are held hostage in a phobia until we overcome our fears, either on our own or through counseling.

Foraging, food intake, and obesity

Obesity is something we hear about continually in the media and is defined as having an excess of body fat. Some scientists consider obesity a disease, while some don't. But, there are two things on which everyone can agree. First, that across the globe the incidence (or rate) of obesity is increasing and that secondly, obesity is a phenomenon we see in humans but not wild animals. In fact, it would be impossible for most wild animals to become obese.

A Splendid Clubtail dragonfly (Gomphus lineatifrons) feeding on a River Jewelwing damselfly (Calopteryx aequabilis). Photo credit Nancy McIntyre.

There are many negative consequences for an animal that becomes obese in the wild. Obesity would reduce its escape speed, make it harder to breed or to hide. It is not because wild animals don't have the genes or DNA to become obese. For example, Volcano mice are normally lean in the wild but when brought into the lab, and fed standard mouse chow, about 50 percent of the mice develop obesity. This suggests that there is something about living in the wild that reduces the likelihood of obesity.

One factor that is known to interrupt eating and may contribute to the lack of obesity in the wild is predation. The evolutionary selection pressures to remain vigilant for predators are strong and have shaped the evolution of mechanisms for interrupting feeding rapidly when a predator is present.

While reducing feeding to deal with predators may have immediate benefits, there are long-term costs to not eating that affect development, growth, and reproduction. Thus, a balance called the foraging/predator avoidance tradeoff is an important part of an ecological concept called optimal foraging. Optimal foraging theory is widely used by scientists to predict how animals behave when searching for food. Searching for food requires energy, and optimal foraging theory states that animals need to be as efficient as possible when foraging so that they can maximize growth, development, and reproduction. If prey animals don't avoid predators, none of these things matter.

Many animals must remain vigilant when feeding. Because most animals don't have eyes in the backs of their heads, they must periodically stop eating to scan the area for predators using vision, smell, or sound. Think of a duck that has potential predators under the water, such as a snapping turtle, and above in the form of raptors. Ducks cannot be vigilant for raptors while their heads are underwater looking for food, leaving them vulnerable to raptors above. The result is that an increase in predation threat reduces feeding in ducks.

The sight of a predator can stop an animal from feeding by triggering anxiety and fear circuits in the brain. The sight of a predator can directly interfere with feeding in a brain area called the superior colliculus (or the optic tectum in frogs and fishes) when both a predator and food are present at the same time.

An adult whooping crane (Grus americana) preying on a blue crab (Callinectes sapidus) at Brigantine National Wildlife Refuge, New Jersey. Photo by Tom Fernandes.

Frogs also have cells that visually detect predators located in the thalamus of their brains. In fact, the same prey features that stimulate feature-detecting cells in the optic tectum trigger feature-detecting cells in the thalamus if the stimulus is oriented vertically to resemble a snake. Recent work confirms that humans and non-human primates also have so-called 'snake detecting' cells in their visual thalamus. When a frog visually detects a predator, such as a snake, the information is sent to the snake-detecting cells in the visual thalamus. Nerve cells from the thalamus travel to the hind brain to engage in avoidance behavior and also inhibit food-detecting cells to it from being captured by the prey. Short-circuiting the food-detector cells ensures that frogs and toads deal with a predator first and food second.

Activities in the *Why Frogs Don't Get Fat: Predators, Fear, and Feeding in the Wild* exhibition will allow visitors to experience what it's like to be prey in a safe and responsive environment. Visitors will examine the science behind predator-induced fear/anxiety, examine the impact that fear/anxiety have daily decision making, and rate their responses.

EDITOR'S NOTE: Although Drs. James Carr, Professor, and Breanna Harris, Research Assistant Professor in the Texas Tech University Department of Biological Sciences are co-curators of the exhibition, the work will also feature Dr. Peter Keyel, Assistant Professor of Biological Sciences who is a co-investigator on the grant from the National Science Foundation (IOS # 1656734) that supports the exhibition.

THE PREHISTORIC FORESTS OF ANTARCTICA

By ***Sankar Chatterjee, Ph.D.***

Horn Professor and Curator of Paleontology

The words lush and green seem odd when applied to the continent of Antarctica. Today, ice and snow cover 98 percent of the continent; the other 2 percent is rock. Antarctica is one of the harshest environments on the planet. As the coldest, driest, and most desolate continent, it harbors a world of extremes. Despite being the most inhospitable place on Earth, it was once verdant and teeming with forests and prehistoric life. No other continent has undergone such radical environmental changes as Antarctica.

One of the first people to uncover evidence of a once greener Antarctic was the British polar explorer, Robert Falcon Scott, and his party. In their ill-fated return trip from the South Pole in 1912, Captain Scott and his party discovered the delicate impressions of plant leaves from the Gondwana rocks near the Beardmore Glacier, scant weeks before the team perished. Despite their fatigue and dwindling supplies, they collected the remains of plant fossils, crucial evidence that the icy expanse around them had once been far greener. Months later when their bodies were discovered in a tent, clutching desperate last letters to their loved ones, there were also the fossilized leaves of *Glossopteris indica*, leaves from a prehistoric tree that no longer exists, along with the preserved wood of a seed fern. The fossil samples are some of the earliest pieces of evidence that the frozen continent was once lush and covered in tall, thriving forests. Previously, this distinctive *Glossopteris* flora was found in abundance across the southern hemisphere, in Australia, Africa, South America, as well as in India.

The Antarctic fossil find proved to be the most crucial piece of evidence supporting Alfred Wegener's continental drift theory that Antarctica, along with these southern continents, had once been part of the ancient supercontinent Gondwana. These prehistoric *Glossopteris* forests existed in Gondwana long before the dinosaurs roamed the Earth. Antarctica was still located at its current polar latitude, where long stretches of light are followed by months of darkness. In those conditions, lush and towering seed fern trees of *Glossopteris* grew in coal swamps and, before the prehistoric forest disappeared, left behind some of the best-preserved evidence of ancient plant life.

MY ANTARCTIC DREAM

Antarctica has been at the top of my list of places to explore since I became a geologist. If I tell someone that I came from Washington, D.C. to Lubbock just to go to Antarctica, the person may look quizzical. But that actually happened in my scientific career.

While I was at the Smithsonian Institution, I taught a geology course at George Washington

Scott's party at the South Pole, January 18, 1912. From left to right are Dr. Edward Wilson, chief scientist (standing); Robert Falcon Scott, leader of the Terra Nova expedition and Lawrence Oates (seated); Henry Bowers and Edgar Evans (standing). It was Dr. Wilson who collected Glossopteris fossils from the Beardmore Glacier area.

University. There I met a colleague, Mort Turner, Ph.D., who was also teaching. Mort was the Director of the Polar Research Division at the National Science Foundation (NSF), who regularly funded Antarctic expeditions. I told Mort I wanted to go to Antarctica because it was the final frontier, but also because 300 million years ago it was joined to my native India, sharing the same geology on the vast supercontinent called Gondwana.

Mort understood the sincerity and intensity of my request but informed me the NSF couldn't fund another federal institution such as the Smithsonian. But if I wanted to go to Texas Tech University in Lubbock, he would consider funding my future project. He told me there was a pioneer polar geologist, Franklin Alton Wade, Ph.D., at the Museum of Texas Tech, who had been involved in studying Antarctic geology since the early 1930's with Admiral Byrd.

Dr. Wade joined Texas Tech in 1954 and created the Antarctic Research Center at the Museum in 1960. He led five expeditions to Antarctica with his students during the 1960s, published some important geological maps and papers of Marie Byrd Land, and collected huge rock samples. Dr. Wade died in 1978, and Texas Tech was looking for someone who could assume his position and start new Antarctic research. I immediately jumped at this opportunity and applied for the position.

I joined Texas Tech in the fall of 1979 and received funding from the NSF for a number of years; and in the spirit of Captain Scott, I began planning a series of Antarctic expeditions. I came to arid West Texas . . . To go to icy Antarctica.

ALLAN HILLS, SOUTH VICTORIA LAND, ANTARCTICA

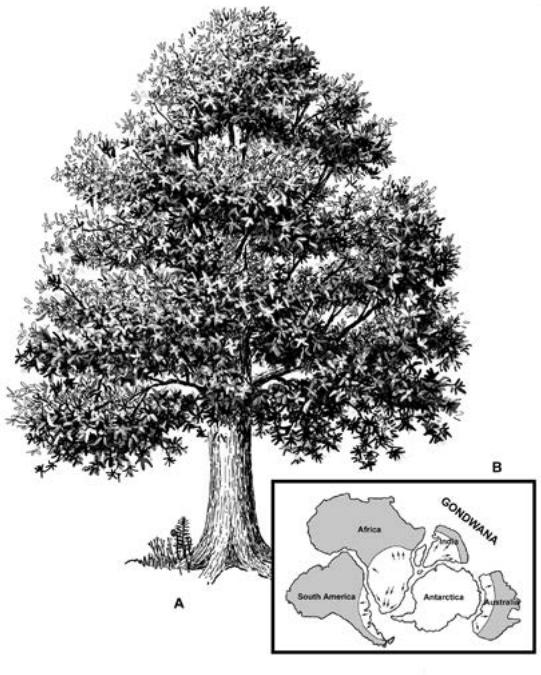
Seven decades after Scott's expedition, I led a series of field trips from the Museum to the frigid wilderness of Antarctica beginning in 1981. Our goal was to find fossilized treasures that uncovered the past life history of this coldest, windiest, and the driest continent at the bottom of the world.

Fossils are difficult to find in Antarctica because ice covers 98 percent of the landmass, and most places are inaccessible without a helicopter and other logistical support. The most promising fossil locations were mountain peaks protruding above the two-mile-thick ice sheet.

During the 1982-1983 field season, my student Bryan Small, my mentor from the Smithsonian Institution Nick

Hotton, and my old Antarctic colleagues, Hal Borns and George Jacobson from the University of Maine, joined my team to explore the Allan Hills.

From McMurdo Station, the American Antarctic base on the southern tip of Ross Island, we flew to the Allan Hills of Victoria Land in two Navy Hue helicopters with our camp gear, field equipment, tents, radio, and food supply. The pilots dropped us at the Allan Hills and instructed us to make radio contact with McMurdo every morning.



The distribution of Glossopteris fossils was among the first evidence for continental drift theory. A reconstruction of the iconic Glossopteris tree is shown in section A of this image. Part B of the image shows a paleogeographic reconstruction of ancient supercontinent Gondwana during the Early Permian (about 250 million years ago) showing the extent of the ice sheet in southern continents. After deglaciation, Late Permian Glossopteris forests occupied all these Gondwana continents. Glossopteris became extinct during the end-Permian mass extinction.

For two months we would be cut-off from the rest of the world. In this vast and desolate expanse of blue ice, we pitched our Scott tents and began to succumb to the stark beauty of Antarctica – a sleeping princess in her billowy white robes in frozen slumber. Bundled in NSF red parkas to brave the negative temperatures, the brutal katabatic winds, and the blinding days of 24-hour sunlight, we searched for fossils in the black and gray Gondwana sedimentary rocks for clues.

The Allan Hills comprise horseshoe-shaped exposed rocks showing a few peaks in a vast expanse of ice. These hills are part of the mighty Transantarctic Mountains in southern Victoria Land.

Numerous meteorites have been discovered in the ice around these hills by NASA scientists. The Gondwana rocks exposed at the Allan Hills consist of flat-lying rocks of fluvial continental sediments from ancient Gondwana, ranging in age from the Permian to the Jurassic. I have worked on similar rocks at the beginning of my scientific career in India. Our goal was to explore the Permo-Triassic Victoria Group of sediments, namely the Weller Coal Measures, the Feather Conglomerate, and the Lashly Formation, all representing bottom-to-top sequences; it was our job to map the sequences and search for ancient life in these rocks.

The time frame preserved in the Gondwana rocks of the Allan Hills is exactly what we were looking for. The Permian Period ended 250 million years ago in history's greatest mass extinction, as the Earth rapidly shifted from icehouse to greenhouse conditions. More than 90 percent of the species on Earth disappeared, including the *Glossopteris* polar forest. This forest is a glimpse of life before that extinction.

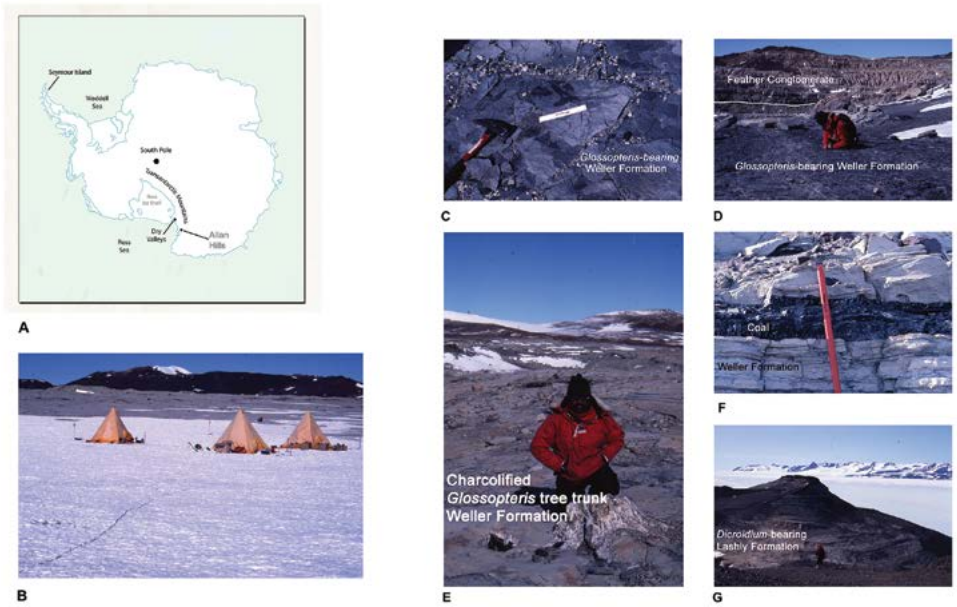
At the end of the Permian Period, Antarctica became more humid than it is today. The climate of Antarctica fluctuated from icehouse to greenhouse conditions during the Permian -Triassic transition. Here in the Allan Hills, we discovered the turnover of Gondwana plants from *Glossopteris* flora to *Dicroidium* flora after the end-Permian extinction.

GLOSSOPTERIS FLORA

About 300 million years ago, the ancient Gondwana supercontinent was covered by a massive ice cap. As the ice sheet retreated around 260 million years ago, a broad, low-lying river floodplain developed, followed by the establishment of lush strands of *Glossopteris* forest. This deciduous swamp forest was dominated by tree-sized seed ferns – *Glossopteris* and *Gangamopteris* – along with conifers, clubmosses, and horsetails.

Glossopteris was a woody, seed-bearing tree, some apparently reaching 90 feet tall. They had a softwood interior. Wing-shaped seeds were borne on one side of variably branched structures. Its most common fossil is that of a tongue-shaped leaf with a prominent midrib and a reticulate venation. The female reproductive organs were generally attached along the midrib. *Glossopteris* leaves are commonly found in thick mats, suggesting the plant was deciduous, losing its leaves each fall. *Glossopteris* leaves were shed seasonally in the autumn to conserve energy over the winter.

The concentration of plant material from the abundant vegetation gave rise to several coal seams in the Late Permian deposits associated with the *Glossopteris* fossils. *Glossopteris* fossils have been found previously in the Permian beds in India, Australia, Antarctica, South America, and Africa. For



Section A is a location map of Allan Hills in Antarctica. Section B shows field camps showing three Scott tents on blue ice in Allan Hills. Sections C through G are photographsv of Allan Hills showing Permian-Triassic rock exposure and fossil floras. Section C shows Glossopteris leaves in the gray shales in the Upper Weller Formation. Section D shows extensive Glossopteris fossil horizon in a bedding plane of gray shale in the Weller Formation; the white line in the rock layer marks the boundary between the Permian Weller Formation and the Triassic Feather Formation, the end-Permian extinction horizon. Section E shows a Glossopteris tree trunk in an upright position in the Weller Formation showing charcoal remains that indicate ancient forest fire. Section F is a coal seam within the Weller Formation. Section G shows Dicroidium-bearing fossil horizon in the Late Triassic Lashly Formation.

many years it was a primary line of evidence for the existence of Gondwana. The ecology of these cold-climate swamps resembles the present-day boreal taiga of Canada and Siberia.

From the green and gray shale of the Weller Formation of the Allan Hills, we had collected large samples of the *Glossopteris* fossils. In the horizontal bedding plane of gray shales, we encountered thousands of leaves, stems, seeds, trunks, and reproductive structures, stacked beautifully, layer upon layer, like an ancient manuscript, each layer with its story to tell. It was a paleontologist's dream.

Touching all the fossil leaves, hundreds of them in one place, I sensed an epiphany, a sense of awe and wonder, a recognition of something beyond the boundary of human experience. In my imagination, the *Glossopteris* forest suddenly came to life. I was walking alone through the forest; the autumn leaves from the tall *Glossopteris* tree are falling around me, insects flitting and buzzing in the still Permian air. I knew that if I continued my walk across Antarctica, I would eventually reach my home in India. It was a profound and wondrous experience of the lost world 260 million years past.

The floral assemblage was quantitatively rich, exquisitely preserved, and was associated with the formation of coal measures derived from the *Glossopteris* swamp forests. Petrified logs and stumps are common in the river channel deposits, indicating driftwood. We encountered rich and thick coal seams, pristine and bituminous grade. The stumps are frequently shot through with zones of charcoal, and the logs are universally encrusted with charcoal, indicating forest fire. In rare cases, *Glossopteris* tree trunks are preserved in an upright position with a charcoal core, indicating evidence of forest fire. The flora is beautifully preserved and comprised of pteridophytes and gymnosperms. The flora of the Weller Formation shows close similarity with the Late Permian assemblages of India, South America, and Australia.

We carefully collected large numbers of *Glossopteris* samples using our portable jackhammer, trimmed them into small slabs, and carefully packed them into wooden boxes for shipment. Antarctica played a crucial role in the dispersal of *Glossopteris* flora to adjacent landmasses during the Permian because of its central position in Gondwana.

END-PERMIAN EXTINCTION

The end-Permian extinction records the most severe mass extinction in Earth's history—more than 90 percent of marine species and about 70 percent of terrestrial vertebrate families were killed.

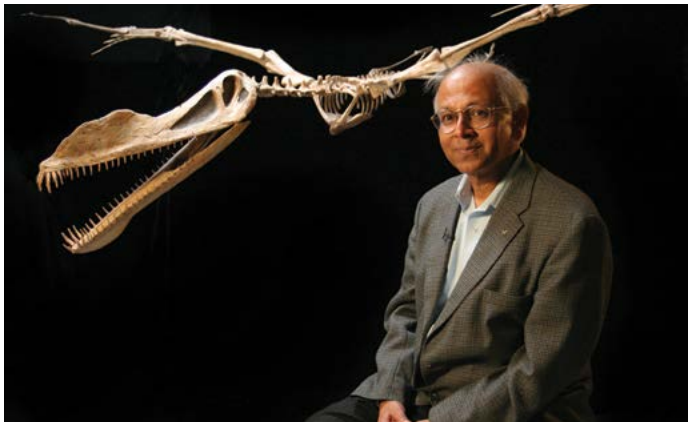
On Gondwana, the widespread *Glossopteris* forests perished. No one knows exactly what caused the mass extinction ending the Permian Period, but it is linked to a dramatic increase of carbon dioxide in the atmosphere that rendered the ocean toxically acidic; consequently, the entire marine food chain collapsed.

The culprit was very likely massive Siberian flood basalt volcanism that vented massive amounts of carbon dioxide and sulfur dioxide in the atmosphere, which caused global warming, acidic oceans, and triggered this extinction. As an aftermath of the end-Permian extinction, a generally warmer and less seasonal climate prevailed on Gondwana, with *Dicroidium* flora replacing the *Glossopteris* flora.

The Permian Period ended 251 million years ago. A small slice of the vanished Permo-Triassic polar forest remains preserved in the Allan Hills, in the form of exquisite fossils. These ancient fossils tell us how these plants responded to the climatic, environmental changes that brought about the extinction crisis.

DICROIDIUM FLORA

The end of the Permian and the start of the Triassic was a warm, wet time. There was a sudden appearance of new flora characterized by the first forked-frond seed ferns. *Dicroidium* is from the genus of pteridosperm foliage; they looked like ferns but were trees. The Late Triassic Lashly Formation of the Allan Hills has yielded a beautiful assemblage of *Dicroidium*, and the related pteridosperms, equisetaleans, a unique plant fossil found in all the Gondwana continents.



Sankar Chatterjee

The leaves are similar to those of modern ferns, but like all seed ferns were thick and had substantial cuticles. *Dicroidium* differs from other seed ferns leaves in having a forked rachis, resembling two conjoined fern leaves. These plants had both male and female reproductive structures.

The *Dicroidium* flora is diverse and prolific across Gondwana throughout the Triassic Period. Gondwana was still intact, and this facilitated the wide distribution of *Dicroidium* plant species. Persistence of greenhouse conditions from the end of the Permian through the Triassic allowed the rich and diverse *Dicroidium* forests to develop in the polar regions of Antarctica. In 1999, my colleague from Augustana College of Illinois discovered bone fragments of a distant mammal relative called dicynodont, about the size of a large dog that roamed in the *Dicroidium* forest and fed on the vegetation. These fossils are common to all Gondwana continents.

FOREST FIRE

We also found telltale evidence of ancient forest fires in the shale deposits of the Lashly Formation, showing fine particles of ash, charcoal, and volcanic glass. Perhaps wildfires in the *Dicroidium* forest were ignited by nearby volcanic eruptions, as we see today in the erupting Kilauea volcano of Hawaii engulfing the neighboring forest preserve. The lava and pyroclastic flows are considered the primary cause for igniting forest fires.

EPILOGUE

The fossil forests of Antarctica are a reminder that conditions on the frozen continent were very different in the distant geological past. The paleoclimate was evidently warm enough to support forests during the Permian-Triassic time.

Visiting the frozen wasteland of Antarctica today, it is hard to believe that once upon a time polar forests flourished where today two-mile-thick ice-sheets exist. However, the fossil record provides irrefutable evidence that at the end-Permian *Glossopteris* became extinct and were replaced by the *Dicroidium* flora, associated with dramatic climatic fluctuations.

Over the past 50 years, Antarctica has warmed at an alarming rate, faster than any other part of the world. The icecaps from polar regions are melting at an alarming rate, causing a rise of the sea level, drowning the lowland habitats, and creating hurricanes and floods. We have added billions of tons of carbon dioxide to the atmosphere by burning fossil fuels and deforestation that has triggered global warming and climate change.

During the last half-billion years, there have been five mass extinctions, when the diversity of life on Earth was suddenly and dramatically devastated. Are we precipitating another mass extinction, the sixth extinction? This time the agent of destruction will not be massive volcanism or a bolide from the outer space, but us. Perhaps we are witnessing the Permian -Triassic extinction, in slow motion, in our own time.

Our expedition to Allan Hills resulted in one of the finest Antarctic plant fossil collections anywhere in the nation, representing that crucial geologic time in Earth's history when Antarctica was a lush and green forest.

After our expeditions, we cataloged all the plant fossils in the Museum's Paleontology Division, and they remain archived for future researchers, with the hope that others will continue our legacy of published papers on the once-verdant world of Antarctica.

NSRL Combines Forces with TxDOT to Conserve Texas Wildlife

Two researchers affiliated with the Natural Science Research Laboratory (NSRL) are conducting research in partnership with scientists at the Texas Department of Transportation (TxDOT). Richard Stevens, Ph.D., assistant curator of mammals, and Caleb Phillips, Ph.D., curator of the Genetic Resources Collection, are collaborating with colleagues at TxDOT on research projects involving bats and spiders, respectively. These projects are designed to help gather scientific information so that TxDOT can be more wildlife friendly. In addition to gathering valuable scientific data, these research projects have helped fund graduate student research at TTU. Below are some of the highlights of the research.

Bat Research

Bats are a highly diverse group of mammals, with 33 species represented in Texas. The vast majority of Texas bats are insectivorous, consuming species that are pests to humans and our agricultural livelihood. Bats are voracious foragers and have been documented to consume as much as 85 percent of their body weight in insects each night.

Such voracious foraging on insects has definite economic impacts, particularly regarding agricultural production. In Texas, it is estimated that more than 100 million Brazilian free-tailed bats disperse nightly from caves and highway structures such as bridges and culverts. This species consumes important crop pests such as the adult stage (moths) of the fall army worm, cabbage looper, tobacco budworm, corn earworm, and the cotton bollworm. A single Brazilian free-tailed bat can consume 20 bollworm moths in a single night.

A Cave Myotis (Myotis velifer) roosting in a ceiling drain of a culvert. Photograph by Holly Wilson.

Such a foraging bout translates into 2 cents per bat per night of ecosystem services that are provided by each Brazilian free-tailed bat because additional pesticides would not need to be applied to achieve the same yield of cotton. This ecosystem service, when extrapolated across all Brazilian free-tailed bats potentially foraging over cotton producing areas, translates to an annual agro-economic value on cotton of up to $1.725 million. That is substantial when compared to the value of the crop in this region of $4.6 to $6.4 million per year.

Just as bats provide valuable ecosystem services to humans, TxDOT provides valuable services to bats in the state. Eighteen species of bats that live in Texas use highway structures as day roosts.

For many Texas bats, the most critical factor limiting their distribution is adequate day-roosting sites. Little is known as to what kind of bridges/culverts are attractive to bats or what characteristics bats choose when deciding to roost in a bridge or culvert. So, enter Stevens and his research team. The Stevens lab has initiated a collaboration with TxDOT

in the Trans-Pecos region of Texas which includes: Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, Pecos, Presidio, Reeves, Terrell, and Val Verde Counties. They are trying to better characterize the bat-highway structure interaction. This is an ideal ecoregion in which to initiate a study because it has the highest diversity of bats in the state and is home to 26 of the 33 species of bats that occur in Texas.

Stevens and his team will estimate roost use by the bats. The team will systematically examine 500 bridges and 500 culverts to estimate bat occupancy. Also, they will examine 16 bridge, 12 culvert, and 13 landscape characteristics associated with each structure to determine whether bats are selecting particular highway structure characteristics or if they use highway structures only in certain landscapes. Through these efforts, TxDOT can manage highway infrastructure in a way that benefits bats and ultimately contributes to the economic impact of Texas.

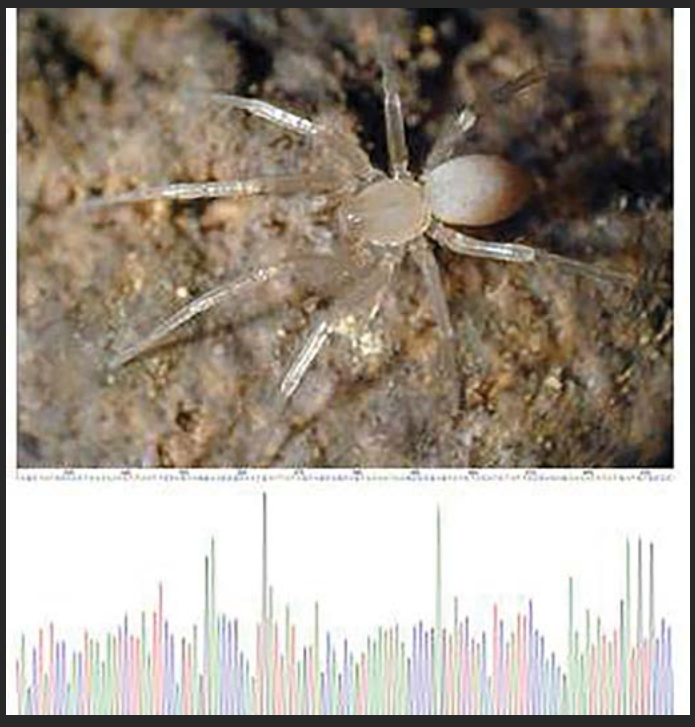
Spider Research

Caleb Phillips is continuing a *Cicurina* sequencing project that began in 2014 in collaboration with TxDOT, James Cokendolpher, NSRL associate curator of invertebrates, who is now retired, and Zara Environmental LLC. This project was highlighted in M Magazine in fall 2016.

Cicurina is a genus, or group, of eyeless, cave-dwelling spiders, some of which are listed as endangered by the U.S. Fish and Wildlife Service. Some of these rare species have been discovered in the limestone underground caverns of the Edwards Aquifer in central Texas. However, genetic sequencing is necessary to determine if a specimen is a protected species or a more abundant variety.

The Phillips Laboratory has been sequencing the genomes of *Cicurina* specimens discovered in caves that are potentially impacted by road construction projects. The on-going research between the Phillips Laboratory and TxDOT has helped to identify the distribution of *Cicurina* species and potential areas of concern in the road development process and has aided in the planning of TxDOT projects to minimize negative impacts and help preserve the biodiversity of this region.

Holly Wilson, a doctoral student, inspecting an expansion groove underneath the deck of a bridge for roosting bats. Photograph by Kimberly Reilly.



A Cicurina spider photographed in a cave near San Antonio. The central body structure to which the legs are attached is called the thorax. Note the absence of eyes on the anterior (left in photo) end of the thorax. At the bottom of the figure is an image of an example DNA sequence that is compared to a database of DNA sequences to guide species identification. Circurina photo by Jean K. Krejca, Ph.D., Zara Environmental LLC.

Century Plants at Museum

Put on a Once in a Lifetime Display

By ***Lisa C. Bradley***

NSRL Research Associate and

Robert D. Bradley, Ph.D.

NSRL Director

The American Century Plants, or Agave americana, growing near the west and south sides of the Museum's Natural Science Research Laboratory bloomed this summer. Because of their names, it is often assumed that century plants live 100 years. In reality, they live only 10-to-30 years. Once in its lifetime, the plant sends up a single, tall stalk topped with numerous yellow blossoms. The stalk can reach a height of 30 feet.

Have you ever noticed the tall, distinctive plants growing on the west and south sides of the Natural Science Research Laboratory (NSRL) of the Museum? Those odd-looking stalks are the flowers of the American Century Plant, *Agave americana*.

Century plants, often assumed to be so-named because they are rumored to live 100 years, actually live only 10 to 30 years. Once in its lifetime, the plant sends up a single, tall stalk, up to 30 feet in height that is topped with numerous yellow blossoms. Making the floral stalk and flowers is energetically very expensive for the plant – so it must spend years growing and storing water before it is ready to flower! Soon after flowering, the entire plant will die. If the plant's once-in-a-lifetime flowers are cross-pollinated, seeds will be produced that will, under the right conditions, grow into new, genetically unique plants. Agaves also produce suckers or shoots at their base that generate "pups," which are genetic clones of the parent plant.

In the early 1970s, J Knox Jones, Jr., Ph.D., a biological science faculty member and a curator of the NSRL's Mammal Collection, had the idea to create a native cactus and succulent garden along the south side of the newly-constructed NSRL building. The species he collected throughout Texas and planted included century plants, prickly pear cacti, cholla cactus, and other arid-land species. When the NSRL building was expanded southward in 2005, Robert J. Baker, Ph.D., then director of the NSRL, ensured that the plants were carefully removed before construction began, maintained off-site, and transplanted into the current garden area after the completion of construction. The current cactus garden is, therefore, a legacy of the NSRL, with the American Century Plants in the garden being the direct descendants of the original specimens planted by Jones in the 1970s.

Agave americana is just one of nearly 200 species of agave that occur in the southwestern U.S., Mexico, and South America. Many of the agave species commonly are called century plants

Soon after flowering, the entire plant will die. If its once-in-a-lifetime flowers are cross-pollinated, seeds will be produced that will, under the right conditions, grow into new plants.

due to their life cycle of blooming just once after many years of growth and then dying. Numerous agave species are cultivated and commonly used in many parts of the world as ornamental plants.

Historically and today, agave species have been used for a variety of purposes: the leaves yield fibers that can be used for making rope, coarse cloth, baskets, brushes, and thread; the heart of the plants can be roasted and eaten; the spikes at the ends of the leaves can be used as needles; the nectar is a natural form of fructose sugar used in cooking; the dried flower stalks can be used as building materials; the juice or syrup can be used medicinally; and liquid produced from the heart of certain agave species can be used to produce different types of alcohol.

In particular, the core or heart of one species, the Blue Agave (*Agave tequilana*), is the only source for the distilled alcoholic beverage tequila, which is produced primarily in the state of Jalisco, Mexico. Other agave species can be used to produce mezcal, also an alcoholic beverage, but only the Blue Agave produces true tequila.

The cactus garden around the NSRL was created in the early 1970s by J Knox Jones, a Texas Tech biological sciences professor and curator of the NSRL's mammal collection. The garden was removed in 2005 for construction to expand the facility, but the plants were carefully preserved and returned after construction was finished. The American Century Plants that bloomed in the garden this summer are the direct descendants of the original specimens planted by Jones in the 1970s. This image is from about 2001.

Agaves are pollinated by nectar-feeding animals. The agaves in our region of Texas, including the American Century Plants at the Museum, flower during the day and are pollinated primarily by bees and hummingbirds. But many species of agave open their flowers only at night, and those species are pollinated almost exclusively by nectar-feeding bats, specifically the Lesser Long-nosed bat, *Leptonycteris curasoae yerbabuenae*, and the Mexican Long-nosed Bat, *Leptonycteris nivalis*. For these migratory bats, native to Mexico and limited areas of the extreme southwestern U.S., agaves are critical to their survival as they migrate; similarly, the cross-pollination of the agaves by the bats is critical to seed formation and reproduction of the agave plants. Thus, these bats and the agave plants have a mutualistic and symbiotic relationship, and they both play vital roles in the ecosystem.

Unfortunately, both the Lesser Long-nosed Bat and the Mexican Long-nosed Bat suffered severe population declines in the 20th century, and by 1991 both species were listed as endangered in Mexico and the United States. Although the Mexican Long-nosed Bat was always considered a rare species, the decline in the Lesser Long-nosed Bat was especially troubling – by 1988, only a few thousand individuals remained, scattered among 14 roosts in the U.S. and Mexico.

The population declines were due primarily to the loss of habitat, including the destruction of roost sites, land conversion for agriculture, and the harvesting of agave to make mezcal and tequila. To obtain the sugars from the heart of the agaves that produce these liquors, the plants are harvested and destroyed before they flower, thus eliminating the opportunity for the bats to feed on them and, ironically, limiting the reproduction of the very plants on which the tequila producers rely for their product.

In 1994, a cooperative, binational program of recovery, specifically aimed at the Lesser-nosed Bat, was established between Mexico and the United States that included research, active environmental education, and direct conservation actions. Rodrigo Medellin, a mammologist at the National Autonomous University of Mexico and a leading researcher of these bats, began working with tequila producers to join in conservation efforts to protect nectar-feeding bats by allowing 5 percent of their agave crop to flower. Cooperating tequila producers are certified as "bat-friendly" and are using a bat-friendly label on their bottles as a marketing tool. This has been very popular with consumers, thus benefitting both the tequila producers and the bats.

These efforts, combined with protection of roost sites, have been so successful in aiding the recovery of the Lesser Long-nosed Bat that the species was delisted as an endangered species in Mexico in 2015 and the United States in 2018. There are now an estimated 200,000 bats in at least 75 roosts between the two countries.

Unfortunately, the Mexican Long-nosed Bat remains listed as endangered in Mexico and the United States. Only time will tell whether conservation efforts will help this species survive.

Almost every year, at least a few of the Museum's agave plants flower during the late spring and early summer – so walk by the southwest side of the Museum and enjoy the impressive beauty of these giants. And remember, you don't have to wait 100 years between flowering events!

The core of one species of agave, known as Blue Agave, is the only source for true tequila. The plants that grow in Mexico are pollinated primarily by the Lesser Long-nosed Bat (shown above) and the Mexican Long-nosed Bat. Both suffered severe population declines in the 20th century. A cooperative program has been established by tequila makers and the U.S. and Mexican governments to save the bats.

Artist of Museum Lobby Mural Remembered

By ***Cameron L. Saffell, Ph.D.***
Curator, History Division

EDITOR'S NOTE: Artist Peter Rogers painted the mural in the lobby of the Museum of Texas Tech University. He died May 28, 2018, at his home on the Peter Hurd Ranch. Dr. Saffell has detailed the history of the artist and the mural.

Peter Rogers – Photo courtesy of Mike Clarke

Throughout his life, artist Peter Rogers described his artistic career as having two parts—one out of love and one out of necessity. One part was the journeyman artist, someone working on commission producing portraits, watercolor landscapes, oil paintings of distant places, or realistic murals to have an income and keep things going.

His second was much more personal, more spiritual, more visionary—he said he could never find the right word for it. He called it "The Quest," to reach oneness with God, an allegory for spiritual enlightenment. "I live in the world, so I paint the physical world," Rogers said. "And I paint the spiritual world as well."

His quest began, unknowingly, in 1949 with a pencil drawing of a man and a small dog crossing a bridge, both following a path that disappears up the side of a hill. Rogers described it as not knowing what is beyond the precipice. Late in his career, he saw the piece as a prophetic metaphor, recognizing himself as the man who had not yet reached that precipice, something that was very true of his own young life at the time.

Rogers was born in London in 1933 into a family with almost no artistic background. His maternal grandfather was an expert on medieval tapestries and a friend of William Morris of the pre-Raphelite movement of design in the late 19th century.

"That's the only art heritage in my family," Rogers said. "There are no other painters that I know of." But his mother shared with Rogers the mementos of period furniture, wallpaper, and patterned fabrics left behind by his grandfather.

The family moved out of London during the German Blitzkrieg of World War II to the country community of Sexon when he was six years old. His prep school relocated during the war to the Fulford Estate in Devonshire. One of its buildings was an Elizabethan castle home filled with art of the old masters—Rembrandt, Van Dyck, Albrecht Dürer, and others. This setting started a deep appreciation for history and art that he carried with him when at age 13 he went to school in Sherborne. There he received his first formal instruction in art, spending as much time as permitted in the art room practicing drawing. He graduated in 1952 at age 19.

After a two-year stint in the British Army, Rogers attended the Saint Martin's School of Art in London between 1954 and 1956. The classes were profoundly influential on him, although he left in part because he felt he needed to get out on his own and away

from all outside influences. He also left to follow a ballet dancer to whom he was engaged, but whose father would not permit the marriage until Rogers could show a solid, steady income—a challenge for any artist just coming out of school.

Rogers did a lot of portrait commissions to make a living. A year after leaving Saint Martin's, the prestigious Royal Society of British Artists selected him for membership—a major honor for such a young artist. While that opened important doors for him, it was not until he was invited to mount a small show that he caught the eye of a leading London gallery, Arthur Tooth & Sons, who agreed to represent him.

It was during this early period that he sold his first personal, visionary works. Though raised as an Anglican, Rogers had ceased being an active Orthodox Christian during his art school days. Even as he sorted through other religious theologies popular in 1950s London, he felt that he was somehow searching for the "Kingdom of Heaven" in his art. This led to a spiritual feeling that if he tended to this "raised awareness," then the material things would take care of themselves. Rogers later said that he was constantly amazed that certain jobs just appeared that allowed him to finance his life and career.

Peter and Carol Rogers – Photo courtesy of Mike Clarke

Rogers often spoke of a concert in 1960 during which he had a graphic vision—one that he thought was of the Ascension, the rising of Christ into heaven after the resurrection. He began painting versions of this vision. While he had been painting religious themes for several years, this specific vision became a key focal point of his Quest for the rest of his career.

The nomadic lifestyle of a ballet dancer, coupled with the challenges for a young painter, even with his early successes, led to the end of Rogers' first marriage in 1962. Shortly after his divorce, he moved to Spain, where the village of Mojacar offered a free parcel of land to anyone who would build a house. He tried again to paint the Ascension from his vision, this time as a small mural on the inner wall of his home. He continued to contemplate his surroundings, his vision, and his philosophy. "I felt as if someone had me by the scruff of the neck, leading me from one place, one person, one book to the next." His work became entangled with his private search for meaning.

While living in Spain, Rogers met Carol Hurd. While she mentioned that she was from a family of artists, Rogers was not aware of who they were. Her father Peter Hurd, her mother Henriette Wyeth, her uncle Andrew Wyeth, and her grandfather N.C. Wyeth were all quite famous artists. Rogers said his initial concern was that his future in-laws could be a "bunch of hacks" until he learned more about them.

The family had similar concerns about Rogers until they found out about his studies at St. Martin's and his membership in the Royal Society of British Artists. When Carol returned home to the Hondo Valley west of Roswell, New Mexico, in 1963, Rogers packed up his paintings and followed. He soon became enmeshed in the life of the family ranch and their artistic activities and married Carol the following year.

Rogers' work as an artist on commission in this country was quite varied. Among his first jobs was a series of wash and ink drawings of the Hondo Valley, ordered by Roswell oilman Robert O. Anderson. His company, Atlantic Richfield Oil Company (ARCO), hired Rogers to paint a series of 48 paintings related to their newly discovered oil fields in Prudhoe Bay, Alaska. The job was part of a long-running association with Anderson and his family. Rogers described Anderson as his patron who personally purchased over a hundred pieces and two murals from Rogers, a mix of commissioned works and material from the Quest.

Other work followed. In the early 1970s, Dr. Hayes Caldwell of Phoenix commissioned Rogers to make drawings and paintings of 23 trading posts on Arizona and Utah Indian reservations. The Anaconda Copper Mining Company and ARCOMEX hired Rogers to paint murals in headquarters buildings in Denver and Mexico City, respectively. Other private commissions came in, and soon his work was carried by the Janus Gallery in Santa Fe and the Baker Gallery of Fine Art in Lubbock.

Rogers is perhaps most recognized for his lobby murals in two public buildings, both of which came about through the assistance of his father-in-law, Peter Hurd. In the early 1960s, Hurd was courted by Texas Gov. Price Daniel, who wanted Hurd to paint an iconic southwestern mural for the new Lorenzo de Zavala State Archives and Library Building in Austin. Hurd

had not done a mural project since completing "South Plains Mural" for the West Texas Museum (today Texas Tech's Holden Hall) in the early 1950s, and he frankly felt he was too old to do another large-scale mural project.

Recognizing the artistic talent of his new son-in-law, Hurd suggested Rogers replace him on the project. Texas officials insisted that Hurd's name remain attached to the mural, but Rogers recounted that all Hurd did was to give Rogers a couple of Texas history books, including Lon Tinkle's "13 Days to Glory, The Siege of the Alamo," and got him started.

In 1964 Rogers completed "Texas Moves Toward Statehood," a sweeping design at 45 feet long by 13 feet high, inspired by Tinkle's account and contemporary movie posters that featured large portraits of the actors in the foreground with historical incidents and iconography in the background. Shortly after completing the mural, Gov. John Connally made Rogers an honorary citizen of Texas.

The mural for the Museum of Texas Tech University was a similarly suggested hand-off from Hurd. As the design of the new museum building came together, museum officials and the architects left a 40-foot space for a lobby mural with the intention of Hurd returning to create another iconic piece as he had done nearly two decades earlier at the old museum building.

Peter Rogers' father-in-law was Peter Hurd, who painted the mural in the rotunda of Holden Hall, which was the first location of the Museum. When Hurd was approached to paint a mural in the current Museum building, he suggested that Rogers was better suited for the job.

University president Grover Murray reminded Hurd of this whenever they saw each other, and by 1973 Hurd broke the news to Murray that he was not up to it, but suggested Rogers as his replacement. By the following fall, Rogers had completed the work.

Rogers acknowledged that, particularly in his public works, he had no specific style. Each job had specific requirements, and thus each evolved into very distinct artworks. In that manner, no one could ever label what kind of painter he was. Robert O. Anderson told Henriette Wyeth that "Peter Rogers might get somewhere if only he'd make up his mind what sort of painter he is."

The reality of Rogers' artistic style, however, is very much found in his personal, visionary body of work. The theme of the Quest was an ongoing effort, one that he reimagined and repainted on an almost annual basis. Rogers said that being forced to switch between painting the Quest and painting the material world kept him grounded, as well as constantly giving him a break and a fresh eye when he returned to the Quest. His works frequently found their ways into gallery shows and museum exhibitions, and private collectors acquired a great percentage of his work. Rogers wrote about his journey with explanatory images of his work in the 1987 book "A Painter's Quest: Art as a Way of Revelation." The most recent major exhibition of his work, "Peter Rogers: A Painter's Progress," took place in 2011 at the Roswell Museum and Art Center, an institution near the Hurd-Wyeth compound at San Patricio that is historically associated with showing all the family members' works.

By the end of his life, Rogers had painted upwards of 500 works that were part of his Quest series. Santa Fe art dealer and historian Fred Kline recently wrote that Rogers' work was among the best of a small group of visionary artists of personal allegory whose paintings consistently evoke love and deeper meanings of life. Kline compared Rogers' timeless, classical, and deeply philosophical qualities to the English sculptor Henry Moore (1898–1986) and the English poet/artist William Blake (1757–1827), both of whom Rogers cited as influential on his work. Like Blake, Rogers had to find a way to balance commercial success and survival with the personal search for what is inside, but Rogers always considered the Quest series to be his primary concern as an artist.

Peter Rogers is survived by his wife, Carol Hurd, and their three children—Peter de La Fuente, Gabriela de La Fuente, and David Christian Rogers. To see more images of Rogers' career, visit his website at peterrogersartist.com.

The Peter Rogers Mural

By ***Cameron L. Saffell, Ph.D.***

Curator, History Division

Peter Rogers painted the India ink on gesso mural in the lobby of the Museum. The 40-foot mural was painted over the course of 10 months in 1974.

Water is the theme of a 17-foot by 40-foot mural in the lobby of the Museum of Texas Tech University building that completes an intellectual journey of arid and semi-arid lands for visitors who have just walked in from the north parking lot. The building architecture symbolically represents a journey up the escarpments of the Llano Estacado, reaching a climactic conclusion with visions of the reflecting pool outside and the Peter Rogers mural inside.

Texas Tech President Grover Murray directed Rogers to the theme of water, suggesting several desert areas of the greater American Southwest for Rogers to explore for inspiration. Instead, Rogers found a crib dam down the road from his home in the Hondo Valley of New Mexico a fascinating expression of water in nature and man's effort to control it. He began photographing and making artistic studies of the many facets of the dam — the wood timbers, the rocks embedded in them, the debris and weeds trapped at the top by recent floods, the headgate to control the water. He called a neighbor friend and asked to work near the headgate, while cattle grazed in a nearby pasture. He incorporated all these elements into a sketch design that he brought with him to Lubbock.

Over a period of 10 months, Rogers mounted scaffolds to meticulously paint the mural, frequently measuring it against the scaled sketch. He prepared the wall surface with gesso, a mixture of chalk, gypsum, and binder, to create a substrate for the India ink he used to draw or paint the mural's lines. Part of the technique involved scratching through an ink surface to expose the gesso plaster beneath, thus creating a slight bit of three-dimensional depth in the work.

In 2014, Rogers talked about the impact of the mural, saying, "Initially there was a terrible stink because I was just doing the thing in black and white. It's what I felt was needed considering the color scheme in the lobby was something in black and white. But it was an incredibly detailed pen and wash drawing which in the end they were absolutely crazy about, and are to this day."

Rogers frequently would cross the room to the middle landing of the lobby stairs to assess his progress. Visitors stopped to watch him work out the details. One cowboy passing through on his way to the Ranch Headquarters (now called the National Ranching Heritage Center) said he could smell the water, while a volunteer laughingly said that he kept having to "dodge that twig." One person, not wanting to interrupt Rogers, left a note in the scaffold that simply said, "You make magic."

The finished mural varies little from Rogers' final scale model. He did make two significant changes. First, cattle in the pasture became a herd of horses for one simple reason, "I can't draw cows. I find horses more sympathetic." He also added the great blue heron late in the project, providing a needed object in the water in the foreground to contrast with the rocks and sticks tumbling down the dam. One newspaper writer linked the work to the region, "It could be anywhere in the breaklands of the Caprock where spring-fed streams once tumbled over rocks through groves of giant cottonwood trees. Where Indians camped and trapped game.... Where man fought man for possession of water to settle in a waterless land."

Even now, forty-five years later, visitors are drawn to stop and contemplate the finest of details and consider the impact of water on mankind and our existence in the semi-arid Southwest.

The Lasting Legacy of Evelyn Davies

By ***Sally Logue Post***

Evelyn and Bill Davies

You see the influence and generosity of Evelyn Davies and her late husband Bill throughout the Museum of Texas Tech University.

The Diamond M Gallery, established in 1993, holds the art collection of Clarence Thurston and Evelyn Claire Littleton McLaughlin, Evelyn's parents. The William C. and Evelyn M. Davies Gallery of Southwest Indian Art displays the couple's extensive collection of Southwest Native American pottery and textiles.

But Evelyn's influence doesn't stop with the galleries. At 94, she is still involved and providing her input and wisdom as the representative of the Diamond M Foundation on the Board of Trustees of the Museum of Texas Tech University Association.

An active member of the Association, she regularly attends events and pops in every so often just to chat.

"Evelyn Davies has been instrumental in the philanthropy of the Museum Association as well as the Museum," said Jouana Stravlo, executive administrator of the Association. "Her nickname may be Tiny but her heart has a huge generosity for our community. Evelyn's contributions make it possible to support the Museum with various projects and programs that enhance, update, and expand the collections and service of the Museum."

Evelyn's relationship with the Museum began after she and Bill married in 1982. The couple would make weekend trips to Lubbock from her Diamond M Ranch near Snyder to shop and hear the symphony orchestra.

"Not long after we married, a man wanted to buy the ranch, more than I wanted to keep it," she says. "He whipped out his checkbook, so Bill and I moved to Lubbock."

After looking at half-a-dozen towns, they decided that Lubbock had everything they wanted. It wasn't long after the move that they began coming to the Museum, slowly becoming more involved.

"There was a time we thought of moving to a new house in Lubbock and realized that Daddy's art collection was too large and too fragile to move around," Evelyn said. "We knew it would be safer and better cared for in the Museum."

That donation was the first step in creating the Diamond M Gallery. There are 380 American paintings, drawings, and sculptures from the late 19th to the mid-20th centuries in the collection, including an impressive number of works by N.C. Wyeth, a noted illustrator and artist.

Family History

Evelyn's father, C.T. McLaughlin, a Pennsylvania native, did not want to return home and go into his father's business after his release from the army.

"Daddy took the $37.50 he received from the army and bought a train ticket to Dallas," she said. "He wanted to go into the oil business."

After working the oil fields, McLaughlin set himself up as an oil well contractor, meaning he would contract with individuals to drill wells on their land. He created a logo for the business that was a diamond shape with an M in the middle, creating the name of his company – the Diamond M. He was successful with the drilling business and came home one day in the early 1930s and announced he had bought a ranch near Snyder, Texas. Soon enough he had talked an Arkansas oil company into drilling a test well on the Diamond M Ranch.

"Mother said she could see that well from her kitchen window," Evelyn says smiling at the memory. "She could watch the drilling, and when it came in, it was a big well. She said she could only think 'now my windows are going to be a mess.'"

That test well turned into the Diamond M oilfield, one of the largest in the country. Evelyn recalls that Time Magazine did a story on the size of the field that featured a picture of her father.

The Diamond M Ranch would play a role in her marriage to Bill. While they both lived in Houston, each lost their spouse.

"My then husband Gilbert Knox and I knew Bill and his wife; I played bridge

with Bill's wife," she said. "After his wife died, Bill was so tired from running a business and caring for her – he took such good care of her. I invited him to the ranch to get away for a bit and get some fresh air."

Evelyn relates that the foreman at the ranch and his wife liked Bill and would drop hints that she should marry Bill. It turns out they were right.

"The foreman's wife kept telling me she knew how to make wedding cakes," Evelyn laughs at the memory. "When we did decide to get married, she did make our cake."

The Davies Collection

As Evelyn donated her parents' art collection to the Museum, she and Bill were busy building their own collections of Southwest Indian pottery and textiles. The couple had differing interests and collected separately.

Bill's interest went back to when he was a child and would ride the train with his father to New Mexico. His father was an accounting supervisor for the Santa Fe Railroad and would often travel to New Mexico. As a child, Bill would talk to the Native Americans who would bring their pottery and weavings to the railroad platforms to sell to tourists.

"Bill had a love of pottery, and saddle blankets. I loved the storyteller dolls," she said. "We never bought from tourist shops, we also did a great deal of research, and tried to meet and talk to the artists so that we knew we were buying original items."

While Bill had a head start on Evelyn in his knowledge of pottery and textiles, she said she learned from him and quickly became attracted to the Storytellers. Native American history is often not written but handed down from parents to children as stories. The Storytellers are representative of that.

Eventually, Evelyn and Bill decided to donate their Native American pottery and textile collection to the Museum, creating the William C. and Evelyn M. Davies Gallery of Southwest Indian Art.

If anyone doubted just how tough Evelyn is, she attended the opening of the Davies Gallery with a broken hip, fractured arm, and very much against the wishes of her doctor.

"I was in Carillon recovering from the hip and arm, and I told them I was going home on January 30 because I had to get my hair done and get dressed for the opening," she recalls. "The opening was on Feb. 1, and that's almost my birthday, so we were going to turn the opening celebration into a birthday party too. The doctor tried to forbid me from attending. I didn't take to that, and I was there at the Museum."

As for the future, Evelyn says she'll continue to be involved with the Museum. After losing Bill, at age 100, in 2017, she's finally sold the home she and Bill lived in since first moving to Lubbock.

As for the Museum, Evelyn likes the direction Gary Morgan, the executive director, is taking the Museum.

"Dr. Morgan talks about making the gateway to the university," she said. "I think that would be just wonderful."

The Museum's Diamond M Gallery features the art collection of Evelyn's parents Clarence Thurston and Evelyn Claire Littleton McLaughlin. The collection includes 380 American paintings, drawings, and sculptures from the late 19th to the mid-20th centuries and an impressive number of works by N.C. Wyeth, a noted illustrator and artist.

The William C. and Evelyn M. Davies Gallery of Southwest Indian Art displays the couple's extensive collection of Southwest Native American pottery and textiles.

In Any Event

By ***Gary Morgan, Ph.D.***

Executive Director

Museums are far more than caretakers of collections and venues for exhibitions. Around America and the world, museums are experimenting with how they engage with their audiences and communities in innovative ways, and activities and events are a major part of that strategy.

At the Museum of Texas Tech University, we take our public events very seriously – but we also want them to be a lot of fun.

In this article, I want to introduce you to the range of events we support, either by organizing them ourselves or through supporting partners in delivering their programs. Events can be large or small. They can attract thousands of people, or they can be intimate occasions targeted at much smaller audiences. But all events have in common one thing. In every case, we are trying to connect with people in the most diverse ways we can, and by using our spaces to do so, we can bring people into the Museum to enjoy our galleries and learn more about us and what we do.

Receptions and dinners can take place around the dinosaurs in the Museum's main gallery.

The stage in the Helen DeVitt Jones Auditorium is often used for music and other performances.

Every year, the Museum organizes an eclectic array of events, both at the Museum itself and at the Lubbock Lake Landmark. Some of these are now annual events, ones that people have come to expect from year to year. Dino Day, Dia de los Muertos (Day of the Dead), and Archaeology in Action at the Lubbock Lake Landmark are examples of this type of event. Typically, we work with campus and community partners in staging the activities at these events, so that visitors can connect not only with our researchers but also with other faculty and students at Texas Tech University, as well as all sorts of community groups. Where else in West Texas can you not only touch dinosaur bones, but also speak with active researchers in paleontology? Where else can you visit an active archaeology dig, and participate in extracting evidence of human occupation dating back thousands of years? The Museum regards this role of campus-community connector as a vital one – we want to be one of the most publicly accessible parts of Texas Tech. And in partnering with faculty and students, we can elevate public awareness of what the university is doing across all sorts of areas of research and scholarship. And just as importantly, we want to convey to young people that these research activities are things they could do as well, should they wish to pursue these career paths.

There are also ongoing event and activity programs, where the Museum identifies topics or target audiences, often responding to demonstrated interests of the community. These include the Come and See program that explores the artistry and stories of clothing and other textiles like quilts.

Throughout the year, we have an active speaker program where experts in various areas present public talks, often in the Museum's Helen DeVitt Jones Auditorium. Earlier this year, in partnership with Texas Tech's Creative Process Commons and STEM-CORE, we hosted Margaret Wertheim, who explores the day-to-day reflection of mathematics in the world around us. We try as well to augment our exhibits with speakers who can expand on the content of the exhibits. Other thematic events include regular movie showings.

For our two exhibits in fall-winter this year on the Bible and the Qur'an, we will have guests demonstrating the art and skills of iconography for the Bible and Arabic calligraphy for the Qur'an.

Summer is a time for camps and summer classes. We run activities at both the Museum and Lubbock Lake Landmark for children of various ages on topics like arts and crafts, painting, dinosaurs, space, life on the Great Plains, archaeology, the Ice Age, and climate change. We even have a wizards' camp. Quidditch, anyone?

The Museum has a strong reputation as a destination for families, and families will always be a primary audience for us. We are trying to expand that audience, however, and tailored events can help us to do this. In fall of 2017, we began a new program which brings together speakers, performers (music, dance, and poetry), collection objects, and other eclectic elements to explore various themes in surprising ways. While children

are welcome, the targeted audience here is definably adults, so we have augmented the nights with a wine bar so that folks can relax and enjoy the speakers and performers with a glass of red or white. The topics can be as wide as your imagination – the joys of wine, the wonders of women, our relationship with dogs, West Texas music, anything that we can approach from diverse perspectives. We have six Museum by Nights per year, on the third Thursday of the month; keep an eye open for the next.

In counterpoint to targeted programs for adults, we also run events for preschoolers and their families. Early childhood learning is a specialized field that is yielding insights into just how significant are the first five years of life in the development of the individual. Experiences for young children need to be designed specifically for that audience. The Museum runs its JumpStart program for ages 3-5, giving the kids and their families fun learning activities related to topics like "I wanna be a scientist" and "I wanna be an astronaut." At the Lubbock Lake Landmark, 3-4-year-olds can participate in Growing up WILD, using nature exploration and hands-on activities to introduce the youngsters to the natural world.

Museums can serve the very broadest range of user groups including those with special learning needs. At both the Museum and Lubbock Lake Landmark we run programs for special needs audiences. We partner with the Burkhart Center at Texas Tech in developing programs for people on the autism spectrum. We also have special activities designed for those with Alzheimer's that have been developed in partnership with the Raider Ranch lifestyle community here in Lubbock.

There is a rapidly growing body of evidence for how involvement in the arts, culture, and scientific activities can enhance well-being and health in people from all sorts of backgrounds. A recent major report from the Arts Council of England and the National Alliance for Museums, Health and Wellbeing in the United Kingdom documents how engaging with collections, artistic activities, and exhibits can, under proper settings, result in very significant improvements in people's health and wellbeing, and also improve mindfulness and a sense of calm through contemplative experiences. This is an exciting area for research and practice into the intersection between the arts, defined in the broadest sense, and health. The Museum, the J.T. and Margaret Talkington College of Visual and Performing Arts, and the Texas Tech University Health Sciences Center are well placed to be partner explorers of new initiatives around this emerging field.

Not everything is so well scheduled. All through the year, curators and other Museum staff are meeting groups from schools, colleges, and special interest community groups to show them the exhibits or parts of the collections and to explain how the collections evolve and how they are used. This is something of an ad hoc calendar, with our staff responding to requests from people and schools across West Texas and even farther afield.

Overlain on these activities are those events organized by the Museum of Texas Tech University Association. The Association is the membership partner of the Museum and has a program of talks and receptions throughout the year. Most but not all of these events are exclusive for Association members – a great incentive to join the Association to access these special treats. One of their most popular event programs is the Art History lecture program, with morning refreshments and then speakers delivering talks about a variety of artists and art styles.

The Association also organizes one of the largest annual events on Lubbock's arts calendar – the Art on the Llano Estacado art show and fundraiser. The fifth of these was held in April this year and was sold out. Art on the Llano Estacado combines wonderful art from

The Helen DeVitt Jones Sculpture Court is used for large seated dinners, receptions, and other events.

more than 40 local and regional artists, fine food and wines, and entertainment. We see this occasion as important not only to raise funds for Museum educational programming but also to assist in connecting people with the rich artistic talents of Texas and beyond.

In addition to the events and activities that the Museum and Association organize, we also partner with groups on campus and in the community, with the Museum being the venue for a tremendous range of celebrations, performances, and educational happenings. It is impossible to do more than list just a few examples to illustrate the sheer diversity of things that take place within the spaces of the Museum or on the 335 acres of the Lubbock Lake Landmark.

The annual International Arts and Culture Symposium, presented with Sowoon Arts and Heritage and the Texas Tech Office of International Affairs, uses both the Helen DeVitt Jones Auditorium and Sculpture Court.

Tuba Christmas is one of the events that utilizes the Helen DeVitt Jones Sculpture Court for its performance.

An annual International Arts and Culture Symposium is presented with Sowoon Arts and Heritage and the Texas Tech Office of International Affairs, exploring the similarities and differences between Western and Asian culture. We work with the teachers and staff of the Region 17 Education Service Center in hosting an annual prom to provide an academically-linked event for students with special educational needs. The kids can let go, be themselves, and enjoy a formal social event without feeling like outsiders. We collaborate with the Texas Tech University School of Music for two public performances a year, where low-cost stringed instrument instruction is provided to elementary school students, and they have the chance to perform at the Museum in front of families and friends. We partner with the Military and Veterans Program at Texas Tech to hold special stole ceremonies for graduating veterans and active service people. And Department of Design students see their fashions strutted at the TechStyle fashion parade in the Museum's Helen DeVitt Jones Sculpture Court. Just some examples of many.

With its expanse of short grass prairie – being actively restored to its pre-European state by Landmark staff – the Lubbock Lake Landmark can provide a healthy dose of exercise as well as experiences in culture, history, and nature. Bird-watching tours, wildflower walks in the season, night hikes under starry summer skies, and National Bison Day are just some of the events we support with a variety of community partners.

Museums are special places, and having some eccentric events plays to the quirky side of our nature. A regular event we have supported for several years is the Tuba Christmas in partnership with Texas Tech School of Music. Watching and listening to several dozen tuba and euphonium players oompah-pahing Christmas carols is an unforgettable experience for anyone.

And our spaces can be ideal settings for those events where some pomp and circumstance is in order. Museums don't have to be demure; we can revel in a bit of bling. Who doesn't enjoy a good party, whether it is the Texas Tech Chancellor's Council Gala, Art on the Llano Estacado, the American Heart Association Heart Ball, or the Ballet Lubbock Backstage Bash Gala? The Museum truly comes alive to the strains of music, the tinkle of glasses, the hum of cheerful conversation, and even the syncopated tap of dancing shoes. Our main venue for large events is the Helen DeVitt Jones Sculpture Court, but more and more we are also using other galleries to create a unique museum experience.

We are very happy to work with individuals, groups, and corporations in accommodating them at the Museum for their special occasions. Think wedding receptions, or Christmas functions for donors and business partners. The Museum may be just what the doctor (that's a Ph.D. doctor of course) ordered. Where else in West Texas can you sip cocktails under the stern gaze of a T. rex and live to tell the tale? (Note: We don't hold events in the dinosaur hall after midnight. Odd things can happen in museums after midnight.)

Ultimately, events of all sorts and for all audiences are friend-raisers. Every person who comes to the Museum of Texas Tech University or Lubbock Lake Landmark and enjoys their visit, for whatever purpose that visit may have been, leaves as a friend. And museums can never have too many friends!

Hold Your Event at the Museum

Dinner with the dinosaurs. A musical performance. A small reception, business meeting, or lecture. The Museum of Texas Tech University can handle almost every rental need!

The Main Gallery can be configured for dinners or receptions around the dinosaurs.

The Helen DeVitt Jones Sculpture Court can accommodate up to 450 standing guests, or table seating for up to 300. Adjoining the Sculpture Court is the 286-seat Helen DeVitt Jones Auditorium. A rear-projection video system provides flexibility for presentations. The auditorium has a small performance stage, dressing rooms, and a green room.

In addition, three meeting rooms of various sizes can be configured to hold up to 88 people. Each space can be customized with projectors and microphones to meet any audio/visual needs.

Find out more about renting the Museum for your next event by visiting our website at museum.ttu.edu. Or, contact us by email at museum.operations@ttu.edu or phone at (806) 742-2490.

CALENDAR

Pre-Modern Bibles: From the Dead Sea Scrolls to the Complutensian Polyglot Bible

The exhibition illustrates the evolution of the physical Bible, the development of scholarly methods of biblical analysis, and the refinement of multiple ways to convey biblical learning, often to people of limited literacy. The highlight of the exhibition is the creation, in Spain at the end of the Middle Ages, of the Complutensian Polyglot Bible with its elaborate multilingual printing press fonts.

Open through March 3, 2019

The Red That Colored the World

The traveling exhibition is from the Museum of International Folk Art in Santa Fe. It explores the history and widespread use in art of cochineal, an insect-based dye source for the color red whose origins and use date to the pre-Columbian Americas.

Open through Jan. 17, 2019

Ladies in Red

As a companion exhibition to *The Red That Colored the World*, *Ladies in Red* draws from the collection of Clothing and Textiles Division as well as loans from private individuals. It features around 50 articles including a dress worn by former First Lady Laura Bush.

Open through Feb. 3, 2019

Red, Hot & Quilted

The Caprock Art Quilters present *Red, Hot & Quilted*, featuring quilts created around the red theme.

Open through Jan. 17, 2019

Polki – Hidden Power

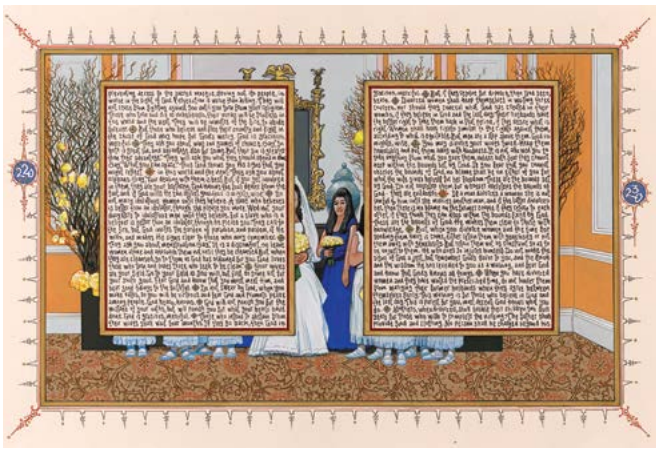
The exhibition aims to take a closer look at Polish women – Polki – and seek out the traces of their feminine, hidden power in their work and art. For centuries women were in a subordinate position regarding their rights, voice, independence, and their social and familial status. They had limited choices, save to muster up the strength to carry on to fulfill the expectations of society.

Open through Dec. 31

Why Frogs Don't Get Fat

In the exhibition, scientists examine fear and what it's like to live in the real world of nature. Learn what it is like to be faced with finding food when everywhere you turn there is something that might eat you.

Open through Feb. 4, 2019



American Qur'an

For the past 20 years, Southern California painter Sandow Birk has focused on applying the vision and scope of history painting to examining issues of contemporary relevance. Taking over a decade to complete, *American Qur'an* is Birk's most ambitious project to date. Members of the Lubbock community with considerable knowledge about the Qur'an will participate in a range of activities related to the exhibit.

Open through Feb. 7, 2019

You can support the Museum

There are more than 8 million objects in the Museum's collections, and each one tells a story about the region and the people and creatures who have lived here over the centuries. We need your help to preserve and increase our collections so that that we can preserve these stories for future generations.

Your donations help us to continue our research into life on the Llano Estacado dating back 12,000 years; restore artifacts; cultivate the curiosity of a child – or an adult – and provide support for graduate students who will become the next generation of museum leaders.

We urge you to donate to or become a member of the Museum of Texas Tech University Association. This membership group has been the foundation of the Museum since it began almost 90 years ago. By becoming a member of the Association, you can receive discounts in the museum shop, advanced information about lectures, performances, films, and special members-only invitations to exhibition previews of events.

For more information about Association membership go to www.mottua.org or call (806) 742-2443.

You may donate directly to the Museum through cash donations, bequests, and endowments. We accept donations of any amount as every bit helps. If you have works of art or artifacts you would like to see held safely in a publically accessible collection, please contact the Museum, and one of our curators will assess whether the objects align with the collections development priorities of the Museum.

For direct gifts, bequests, and endowments to the Museum, contact Emily Phillips, development officer, at e.phillips@ttu.edu or call (806) 834-2833.

Your generous support helps to promote art, science, and culture in Lubbock and the surrounding communities. Whatever the amount of your donation or membership level, you make a difference to the Museum of Texas Tech University and our community.

Yes! I want to become a member in the Museum Association

at the following level:

- ☐ Directors Circle $1,000
- ☐ Curator $500
- ☐ Benefactor $250
- ☐ Patron $150
- ☐ Museum League $75
- ☐ Friends & Family $50

○ Mr. ○ Mrs. ○ Dr. ○ Other _____

Name(s) as they should appear on MoTTUA cards:

_____

_____

Spouse (if applicable)

Address _____

City State Zip _____

Phone _____

E-mail _____

○ This is a gift membership from: _____

_____

Method of Payment

○ Check Enclosed
(please make checks payable to Museum of TTU Association)

○ Mastercard ○ Visa

Card Number _____

CVV Code and Expiration Date _____

Signature _____

Detach and mail to:

The Museum of Texas Tech University Association
3301 4th Street Box 43191
Lubbock, Texas 79409-3191

You may also join online at *www.mottu.org*
or over the telephone by calling the Association Office
at 806.742.2443

MUSEUM
OF TEXAS TECH
UNIVERSITY

Texas Tech University
Museum of Texas Tech University
Box 43191
Lubbock, TX 79409-3191

Non-Profit Org.
U.S. Postage
PAID
Lubbock TX
Permit #378

Coming Spring 2019

A new long-term gallery

The Biodiversity of the Llano Estacado

MUSEUM
OF TEXAS TECH
UNIVERSITY